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# Modern Refractories Laboratory Is Aid to Research

## *Firebrick Maker Studies Problems of Users*

## *Proximity to Manufacturing Plant Proves Asset*

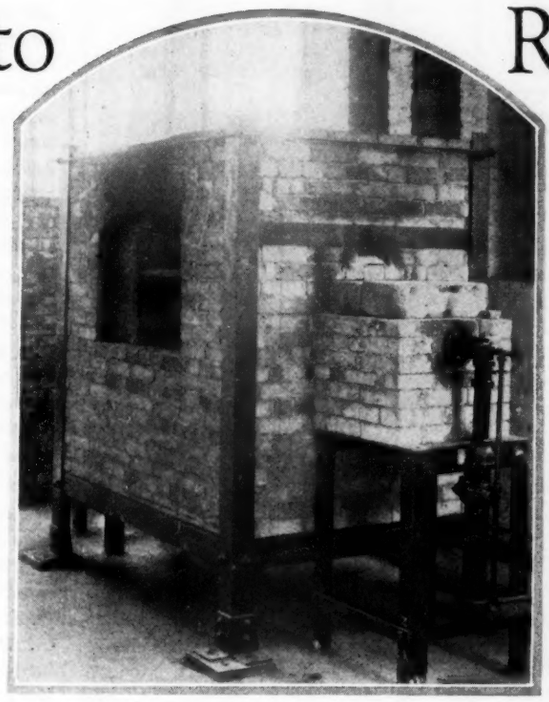


*FIG. 1—This is one of several experimental furnaces in which bricks are burned or tested under carefully regulated conditions*

*By H. R. Simonds*

***Associate Editor, Iron Trade Review***

UNDER apparently favorable conditions of operation, blast furnace lining walls usually fail after a comparatively short campaign. This involves a heavy expense which must be spread over the entire iron and steel industry. Manufacturers of refractories have been actively at work to minimize this burden of expense by the production of a firebrick which would prolong the life of the furnace lining, and during recent years many striking improvements in the quality of firebrick have been made, but the average life of the blast furnace lining remains obstinately at three to four years. In figuring the cost of a lining on the production of pig iron, it is customary to spread over a million tons of pig iron the cost of one full lining.

The strange anomaly of increased quality of firebrick and stationary life of blast furnace lining is brought about by the more severe service

*Fig. 2—The laboratory, shown at left, is housed in a modern well-arranged building close to the manufacturing plant*

demanded in modern blast furnace design. Furnaces now are operated at greater capacity, at higher temperatures and for the most part are larger in diameter than the furnaces typical of 10 or 15 years ago. Firebrick manufacturers have been just about able to keep up with the increased service demands of the blast furnace designers.

Well-equipped research laboratories are determining the cause of the chief weaknesses in present firebricks, and new materials and new methods of manufacture are being tested with encouraging results. A typical example of a modern research laboratory in the refractory field is the Baltimore laboratory of the General Refractories Co. Here under the direction of M. L. Bell and L. J. Trostel, six men are actively engaged in research work on the problems of the users of firebrick. The work in this laboratory comes under the supervision of Dr. R. P. Huer, director of research for the General Refractories Co., at Philadelphia.

The building is a modern, fireproof structure of two stories with basement. It is located close to one of the production plants of the company so that actual manufacturing conditions may be studied in connection with the laboratory work. The first floor of the laboratory is devoted to the physical research and testing. Here also is located a special enclosed room for petrographic studies. The equipment for physical testing includes a spalling and reheating furnace, two testing furnaces for determining the pyrometric cone equivalent of refractory products, a special furnace for studying disintegration of brick by carbon monoxide, a standard high-temperature load testing furnace, crushing and screen appliances, molding press, drying ovens,

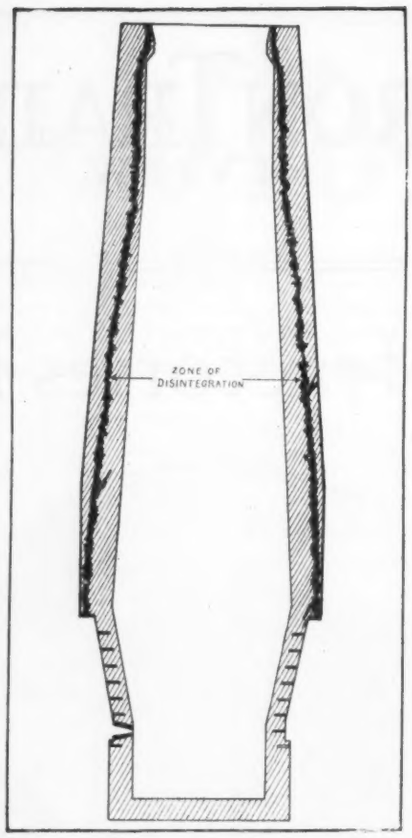



*Fig. 3—The usual carbon deposit, or zone of disintegration, within the grain of the firebrick in a blast furnace lining follows a well-defined line*

pyrometers, and other testing units.

The chemical laboratory is located on the second floor of the building. This is equipped with the usual precision balances, furnaces, hoods, benches and other equipment. The arrangement and facilities are modern, and include forced ventilation and flood lighting.

The work of the laboratory is divided along broad lines into three divisions: (1) Problems of the user of firebrick; (2) problems of the production department; and (3) research investigation. Production processes throughout the consuming industry are changing constantly. New processes frequently call for new properties in the refractories used and the development of firebrick to meet these new demands from industry constitute a large part of the work at the Baltimore laboratory. As a result of this work, former types of firebrick frequently become obsolete for certain established processes which formerly proceeded on the idea that one kind of brick was entirely satisfactory for a number of diverse operations.

Keen competition among manufacturers of refractories, of course is, the chief stimulus behind research laboratory activity. Likewise, competition among other industries forces closer attention to economies in all fields, and the demand for longer and longer life of refractories is part and parcel of the irresistible progress of civilization. In the past, the eventual failure of refractories, supplied for certain types of industrial operations, was taken for granted. Now the attitude is quite the reverse and the request is made of research engineers to modify refractory characteristics so that they will not fail under service conditions.

An excellent example of work along this line is found in the study of failures of blast furnace linings, and the creation of new types of brick to overcome some of these failures. Research work extending over several years gradually has brought to life the cause back of the disintegration of fire clay brick in blast furnaces. The gases of the furnace, containing about 25 per cent CO, come in contact with free iron oxide present in the fire clay brick and, over the comparatively low temperature range of 800 to 900

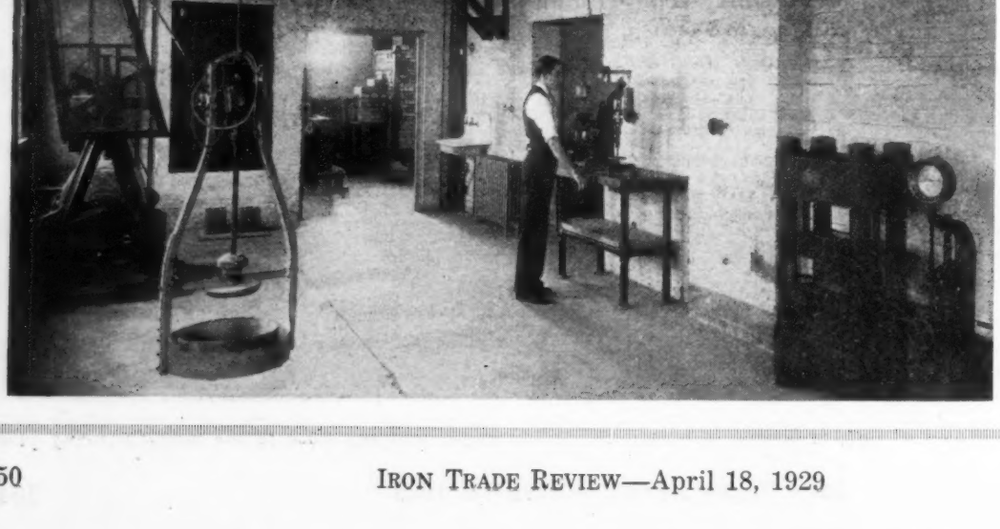


*Fig. 4—One room in the physical testing laboratory on the first floor of the building*

degrees Fahr., carbon is deposited. The chemical change involved may be represented by: $2\ CO = C + CO_2$. The iron oxide does not enter into the reaction, but acts as a catalyst. The carbon is deposited around the iron oxide particles and eventually exerts sufficient pressure to disrupt the brick.

The study of this phenomenon has been aided by the use of photomicrographs taken with the petrographic microscope. An examination of such photographs gives definite proof of the physical cause of the destruction of the brick. Chemical analysis gives the percentage of iron in the brick, but this type of examination is not sufficient in itself to determine the possibility of disintegration because the catalytic action varies with the nature of the iron compound.

Investigation has shown that if free ferric oxide can be converted into ferrous aluminum silicate its activity as a catalyzing agent is negligible. The problem, therefore, is one of producing brick in which the free ferric oxide has been converted to one of the iron silicates. Inasmuch as the temperature in the wall of a blast furnace varies from the inside to the outside and is hotter on the inside surface than 900 degrees Fahr. and cooler on the outside than 800 degrees the point of greatest deposit of carbon will lie somewhere between the two wall surfaces. Inasmuch as the temperature also varies from top to bottom, this line of maximum carbon runs from the surface near the top of the shaft to a point several inches beneath the surface at the hottest part of the furnace. The approximate location of this line of maximum deposit is shown in Fig. 3.

Most research engineers feel that the problem of converting ferric oxide to one of the inactive iron compounds in fire brick has been solved and that a uniform nondisintegrating furnace brick may now be possible. After finding a way to eliminate the catalytic action of iron in clay and thus overcome the disastrous deposits of carbon, the next step was to transfer laboratory results to actual production and to watch carefully all conditions to see that other qualities of the brick were not sacrificed. The technique of changing free iron to iron silicate involves burning at higher temperatures and this, while advantageous in some directions, meant the possibility of creating a brick too hard and too brittle for other types of service. The ideal blast furnace brick must have resistance against slag reaction, against heat disintegration and against physical abrasion. Eventually, after working back and forth first in the laboratory at Baltimore and then in the production plant, a practical high-quality fire brick has been evolved.

The refractoriness of a brick is determined largely by the raw materials. But, many properties other than refractoriness are desirable in brick for metallurgical service. William F. Boericke, mining engineer, New York, has given the essential properties of the ideal fire brick as follows:

1. High softening and melting points under normal load.
2. High resistance against sudden and sharp changes of temperature.
3. Chemical inertness when confronted with the influence of metal oxides, fluxes, and products of combustion that cause corrosion.
4. Minimum possible change of shape and volume under all furnace conditions.
5. High resistance to mechanical stresses and shocks, in both hot and cold state.
6. Uniform composition, so that a buyer may be sure at all times of receiving the identical product.

In an attempt to secure these properties much research work has been done in developing new raw materials for brick manufacture. Chrome brick has a bond at high temperature determined largely by the character of the accessory minerals in the ore. Before the research laboratory took up the study of this property, it was not generally understood why some bricks were strong in this respect and others poor when the process of manufacturing was the same. Petrographic studies have pointed out which impurities in the ore affected the bond and now by proper blending it is possible to produce a uniformly strong bond in brick embodying the high refractoriness of chrome ore. Much the same study and progress has taken place in the manufacture of magnesite brick.

In addition to development work in new fields and to the solving of customer problems, a research laboratory such as that of the General Refractories Co., is called upon to make a great number of routine tests. Samples taken from the various plants of the company are sent to Baltimore for proper testing. The laboratory staff also keeps its eye on new installations, frequently visiting customers' plants and examining brick which are being subjected to a new service. The whole object of the laboratory, of course, is the improvement of the service which the customer gets from his refractory. To this end, co-operation with the former is sought and usually is secured.

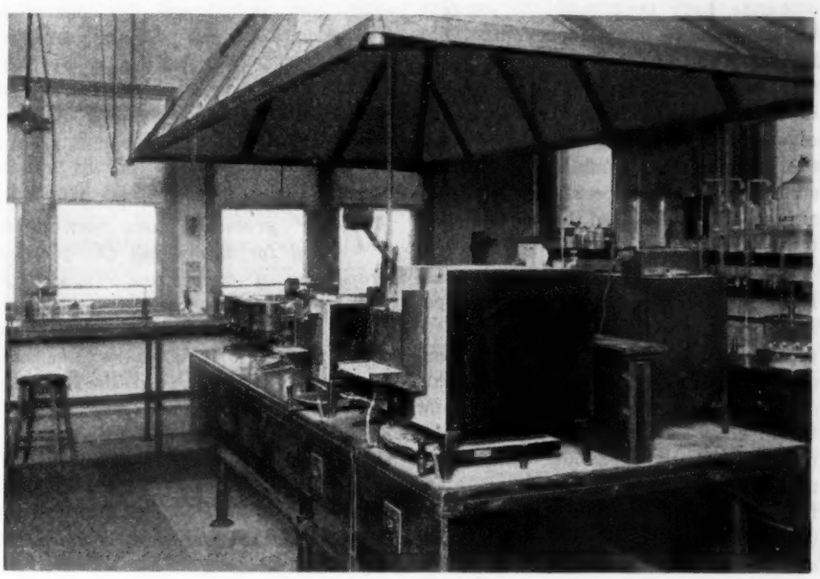


*Fig. 5—A corner of the chemical laboratory on the second floor. The arrangement and facilities are modern and include forced ventilation and flood lighting*

## Management Is Topic

Announcement has been made that the Taylor society will hold its spring meeting at Charlotte, N. C., May 1-2. Headquarters will be at Hotel Selwyn, although sessions are to be conducted in the Chamber of Commerce auditorium. Management problems relating to the metalworking and allied industries will constitute the main topics for discussion.

The Vlchek Tool Co., Cleveland, manufacturer of automobile tools, has made eight additions to its plant in the past eight years.

# Methods for Making High-Strength Gray Iron Are Diversified

## *Quality Is Improved by Controlling Structure of Ground Mass and Form and Distribution of Graphitic Carbon*

*By Edward E. Marbaker*

***Director of Foundry Research, Whiting Corp.***

WHILE the manufacture of gray iron castings is one of our oldest industries, it is only within recent years that serious attempts have been made to improve its properties. This improvement has been fostered by the commercial necessity for better castings, and by the increased knowledge of the metallurgy of steel. It has long been known that the strongest steel exhibits a pearlitic structure which appears under favorable conditions when the carbon content is 0.90 per cent.

Goerens showed in 1906 that cast iron in order to possess the best strength properties should have a pearlitic structure. The examination of many castings served to prove his contention, but no method of insuring the desired structure in every casting had been worked out. Since 1906 many attempts have been made to follow out the ideas of Goerens systematically, and there are now available a considerable number of methods for the manufacture of cast iron possessing improved properties.

Since steel contains no graphite and is strong, it is obvious that attempts should have been made to decrease the carbon content of cast iron. This has been attained by large steel additions to the charge, and the resulting material has been called semisteel, and synthetic cast iron. No special apparatus is required for melting, but the cupola must be operated efficiently from the standpoint of combustion in order to attain the requisite temperature, since the steel mix melts at a higher temperature than ordinary cast iron. Because of this fact the electric furnace has had a wide application in this field. It has another advantage in that the carbon pick-up, which must be taken into account in cupola melting, is obviated, In general the results of melting in the electric furnace have been better than those attained in cupola melting, and this may be attributed to the higher superheat which is attainable.

The investigations of Wust have shown that the results are best when the carbon content is between 2.2 and 3.0 per cent, silicon 2.2 and 1.2 per cent, and manganese 1.0 per cent. The structure consists mainly of pure pearlite with fine and scanty graphite interspersions. As the carbon is decreased the manganese should increase.

Technically this theory is represented by semisteel, the Sternguss of Krupp, Emmel's process, Meehanite, and the Corsalli process. The last mentioned product also falls into the classification of iron produced by superheating. The technology of semisteel has been worked out to a great extent in this country, as is also the case with Meehanite which is made by the addition of calcium silicide to the molten iron. The Krupp, Emmel and Corsalli processes were worked out in Germany and have been widely discussed in the literature. The analyses and properties of the cast iron made by these methods is shown in Table I.

Maurer and Emmel show that with similar composition of materials and without preheating of molds, the pearlitic structure can be obtained within the widest limits of casting section, and the structure is uniform. It appears from this that some other factor than the mere preheating of molds is responsible.

The properties of malleable cast iron long have been attributed to the finely divided form and the uniform distribution of the graphite (temper carbon), and investigators naturally reasoned that the production of gray cast iron containing the graphite in an analagous form would result in an improvement of properties. Goerens declared that the form of graphite theoretically can be influenced without resorting to heat treatment as in the case of malleable iron. The three ways in which this can be carried out are by superheating of the molten iron, rapid cooling of molten high silicon iron and treatment of molten metal with calcium silicide.

The Corsalli process affords a means of obtaining superheat in the standard cupola. Extremely high blast pressures are used and the silicon and manganese which are burned out are replaced by the introduction of ferroalloys into the melting zone by a specially constructed apparatus affixed to the cupola and connecting the charging door with the melting zone directly.

The analyses and properties of the high-test gray cast iron produced by superheating are shown in Table II.

Schuz proposes that the structure of the casting be controlled by utilizing a mixture of definite composition and pouring into chills. The structure is not pearlitic, but a eutectic of ferrite and graphite. The iron contains 3.6 per cent carbon and 3.3 per cent silicon. The modulus of rupture was 120,000 pounds per square inch, and the tensile strength 51,500 pounds per square inch. The final product has a structure and properties comparable to malleable iron, but it is to be noted that the silicon is high.

By treating with calcium silicide a special cast iron called Meehanite is produced. The mixture is melted

*MANY processes have been developed for improving the physical properties of gray iron. Importance has been placed on a pearlitic structure. Proposal has been made that the structure of the casting be controlled by utilizing a mixture of definite composition and pouring into chills. The essential features of various processes are presented in the accompanying article which is from a paper delivered before the American Foundrymen's association, Chicago, April 8-11. The author, Edward E. Marbaker, is director, Foundry Research division, Whiting Corp., Pittsburgh.*

in the cupola, air furnace, or in the electric furnace, and calcium silicide is added in the ladle. The product exhibits structure similar to that of Krupp Sternguss, or Emmel iron.

Considerable attention has been given in literature to the process of agitating molten cast iron in the forehearth which was worked out by Deschene. This method of producing high-test gray cast iron differs materially from the other processes which have been described. The essential feature of the process is a forehearth which is so arranged that the metal, which is drawn from the standard cupola, is subjected to violent jolting. In the other process, the cast iron is improved by chemical and thermal means; in this process the operation is entirely mechanical. The value of the method lies in the fact that the molten iron is thoroughly mixed, gases are eliminated, the sulphur is rendered innocuous by more perfect slagging, and the carbon is brought into more nearly complete solution. The process is worked out more or less independently of the mixture charged into the cupola. The castings exhibit a dense pearlitic structure and a fine fracture. Piping is almost entirely absent.

Lanz, Krupp, Emmel, and Schuz irons are obtained by adjustment of the carbon and silicon contents. The same result may be brought about by superheating and the jolting of the liquid metal. Piwowarsky found that up to 2730 degrees Fahr. the graphite decreases and combined carbon is formed while the residual graphite is fine-grained. Hanemann tried to account for the facts by the germ theory of crystallization, but Osann does not accept this beacuse of the doubt as to the origin of the nuclei. Sometimes superheating fails to achieve its purpose, and success seems impossible unless 30 per cent or more steel scrap is added to the melt. The same object can be attained, says Osann, without recourse to the expensive process of superheating, and in this connection he draws attention to the difference between kish graphite and solid solution graphite. By the latter is meant the graphite liberated by the dissociation of cementite in the solid state. It is the kish graphite which causes poor strength, wear, and frictional properties which must be present to satisfy the requirement of the high-test gray cast irons.

The nuclei of Hanemann are essentially kish graphite crystals which persist during the operation of remelting. They may also be segregated phosphide eutectic or manganese sulphide. These concomitants usually are kept low in high-test cast iron. It therefore is necessary to see that kish graphite is not formed at the outset. It then will be unnecessary to superheat for the destruction of the nuclei. Attempts should be made to obtain eutectic graphite, and the composition of the cast iron should be regulated accordingly. The trouble starts with the pig iron which contains too much carbon in this day of frequent tapping and high hearth temperature.

According to Morschel, in a cast iron containing 2.8 per cent silicon, which solidifies with a gray fracture, or in other words, tends to the formation of graphite, kish graphite crystals separate from the melt when the carbon content is greater than 3.1 per cent and these crystals are present during solidification. These graphite crystals give rise to faulty structure, either indirectly in the form of nuclei as indicated by Hanemann, or directly in the form of extraneous matter. With any cast iron containing 3.75 per cent carbon, there is present 3.75 minus 3.1 or 0.65 per cent carbon in the form of kish. With a different composition the eutectic point is displaced toward a lower carbon content. A number of practical cases are cited in which the kish was removed and the graphite content reduced, not by superheating, but by allowing the iron to stand and considerably retarding cooling.

It is not by mere chance that steel scrap in the cupola or in the electric furnace can be carburized up to a definite limit. The eutectic point is reached at 2.7 to 2.9 per cent carbon, and it is impossible to go further because the iron can dissolve no more carbon. In the ideal state, "Perlite" iron represents a eutectic alloy from which kish is excluded, and the same applies to other high-test irons as well. In Emmel iron the carbon is low in conformity with the increased percentage of silicon. The composition of the eutectic cast iron alloys are not known. There is no single alloy, but a large number because each of the different silicon and phosphorus contents has its own eutectic carbon content. In order not to complicate the matter manganese and sulphur are assumed to remain constant. In this way there should be at least nine different diagrams.

Eutectic alloys do not pipe and this quality can be taken as a critical test of eutectic cast iron. Lanz and Emmel irons come into this category. All the various methods for the production of high-test gray cast iron meet at this point, and this is the common denominator which was sought. Consciously or unconsciously, all processes for the improvement of the properties of cast iron have been directed toward a eutectic composition because it has the advantage of the

(*Concluded on Page* 1056)

**Table I**

## Analyses and Properties of Special Cast Iron

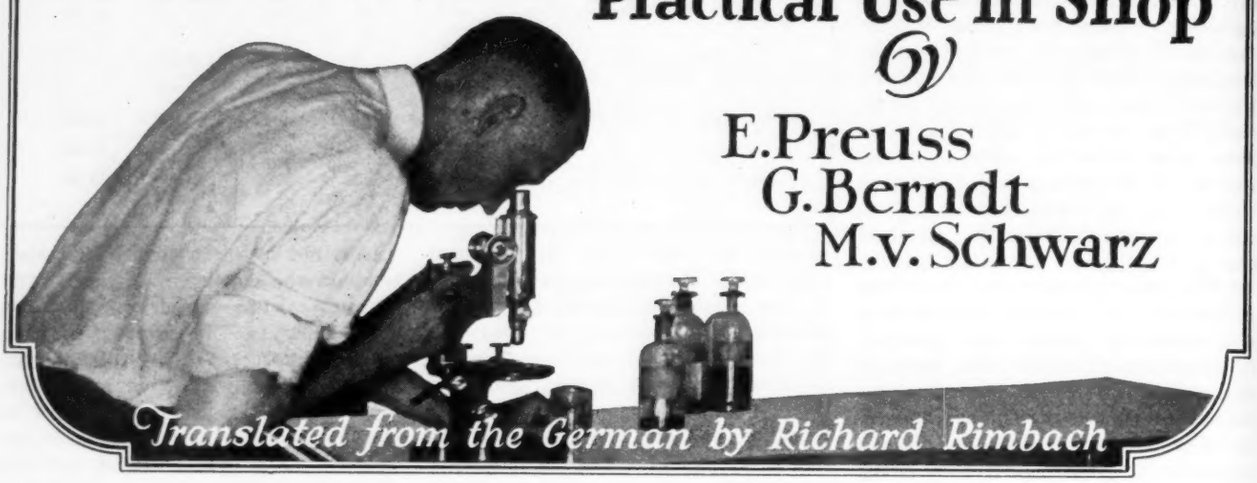
| | Total Carbon, per cent | Silicon, per cent | Manganese, per cent | Phosphorus, per cent | Sulphur, per cent | Modulus of Rupture, lbs. per sq. in. | Tensile Strength, lbs. per sq. in. |
|---|---|---|---|---|---|---|---|
| Semi-Steel: | | | | | | | |
| Cupola (25% Steel) | 3.11 | 2.24 | 0.44 | 0.48 | 0.08 | 56,200 | 33,770 |
| Electric Furnace | 3.12 | 2.23 | 0.64 | 0.42 | 0.042 | 69,900 | ..... |
| Krupp Sternguss | 2.4-2.7 | 1.66-2.33 | 0.86-1.46 | 0.11-0.24 | 0.08-0.13 | 91,000 | 50,000 |
| Emmel (50% Steel) | 2.64 | 2.14 | 1.37 | 0.25 | 0.16 | .... | 52,500 |
| Meehanite | 2.4-2.7 | 1.30-1.80 | 0.50-1.00 | 0.12-0.20 | 0.80-0.14 | 88,000 | ..... |
| Corsalli | 2.73 | 2.20 | 1.34 | 0.26 | 0.11 | 83,800 | 52,100 |

**Table II**

## Analyses and Properties of High-Test Iron

| | Total Carbon, per cent | Silicon, per cent | Manganese, per cent | Phosphorus per cent | Sulphur, per cent | Modulus of rupture, lbs. per sq. in. | Tensile strength, lbs. per sq. in. | Transverse strength, lbs. per sq. in. |
|---|---|---|---|---|---|---|---|---|
| Cupola (Emmel) | 2.64 | 2.14 | 1.37 | 0.25 | 0.16 | .... | 52,500 | ..... |
| Electric Furnace | 3.12 | 2.23 | 0.64 | 0.42 | 0.04 | 69,900 | ..... | 4480 |
| Duplex Process | 3.33 | 2.01 | 0.54 | 0.55 | 0.03 | ..... | ..... | 4287 |
| Corsalli Process | 2.73 | 2.20 | 1.34 | 0.26 | 0.11 | 83,760 | 52,100 | ..... |
| Wust Oil-Fired Furnace | 2.70 | 1.67 | 0.96 | 0.39 | 0.07 | 78,500 | 47,000 | ..... |
| Cupola (Semi-steel) | 3.11 | 2.24 | 0.44 | 0.48 | 0.08 | 56,200 | 33,770 | ..... |

# Metallography Simplified for Practical Use In Shop



By
E. Preuss
G. Berndt
M. v. Schwarz

*Translated from the German by Richard Rimbach*

## Chap. XI—Structure of Crystals; Annealing, Overheating and Burning (Concluded)

*THE first installment of Chapter XII of the current metallography series will appear in the May 2 issue of* IRON TRADE REVIEW. *This chapter concerns the rolling and cold working of steel. The effects produced by methods of processing steel in the finishing stages will be discussed in detail in the next installment.*

DIMENSIONS of the individual crystal grains depend upon the annealing temperatures; the time duration of annealing also has considerable influence. This can be easily explained since, according-ing to G. Tammann, the growth of crystals is determined on the one hand by the speed with which the crystal nucelae are formed, and on the other, also by the velocity of their growth. The latter at first increases with rising temperature and longer annealing at higher temperature or slow cooling from the latter will result in a coarser grain. This can be recognized clearly by comparison of Figs. 165 and 166, of which the former shows the structure of a normally treated low-carbon steel, while Fig. 166 shows the same piece after 36 hours annealing in a Hempel annealing furnace. The crystals grew still more in a piece from a carbon dioxide cylinder (Fig. 167 normal structure), in which, after 36 hours annealing, the crystals had grown so pronounced, sometimes to about ½-millimeter size (see Fig. 168), that they could be clearly recognized with the naked eye, after etching.[43] As the samples just mentioned had been heated to exactly the same temperature and for the same length of time, it appears that the growth of crystals depends on heating, chemical composition and cold working.

The facts surrounding the growth of crystals due to heating may serve to find the causes of fractures. If, for example, considerably larger crystals are found nearer the fracture than at places more remote, and from which it is known with certainty that they have not been exposed to heating, a local heating at the point of fracture will have to be assumed as can happen when a boiler bursts due to lack of water, or when an axle breaks due to hot bearings. Figs. 170 and 171 show two transformer sheets which, although otherwise of equal chemical composition, behaved differently regarding their hysteresis and eddy current losses, the one sheet aging quickly, the other not. An explanation is offered by the different structure of the two samples which can be traced to different heat treatment.[44]

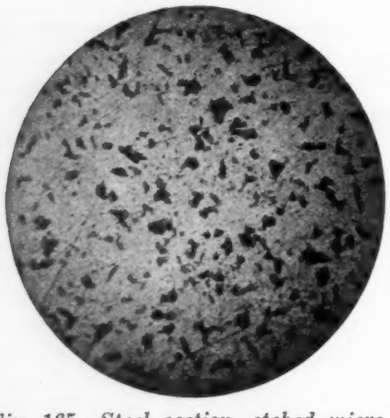


*Fig. 165—Steel section, etched microscopically. X 65.*

[43]The etching of these four sections (Figs. 165 to 168) was done microscopically according to E. Heyn, with a watery solution of copper ammonium chloride, which made the ferrite crystals so rough that in these photomicrographs the structure looks different than after microscopic etching.

[44]Good transformer sheets are made with a content of 3 to 4 per cent silicon. Addition of aluminum has a similarly favorable effect on the hysteresis losses but is less usual. Compare G. Eischberg and W. Oertel: Weber den Einfluss der Behandlung des Transformatoren-eisens auf seine Wattverlustre, *Stahl und Eisen*, vol. 47 (1929) page 262 und Werkstoffausschuss, Bericht No. 87.

*Fig. 166—The same steel as Fig. 165 after 36 hours annealing. Etched microscopically. X 65*

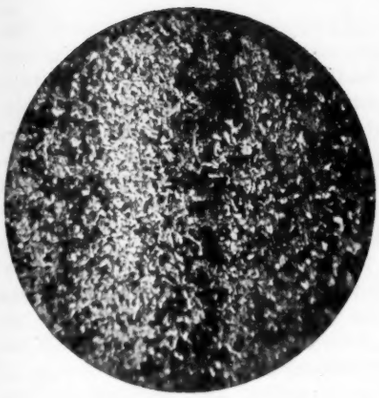


*Fig. 167—Steel section, etched microscopically. X 67*

The growth of the ferrite crystals often begins as low as about 650 degrees Cent. If the temperature remains below 850 degrees Cent. the increasing coarseness of grain is not always bound up with a deterioration of the mechanical properties.[45] Tensile strength and elongation then are changed slightly and notch toughness even increases under certain conditions which is due to a decarbonization of the edge. Fig. 169 represents the section of an annealed flat steel bar in which the carbon (as in a malleable casting) is entirely burned at the edge (upper part of figure). Here only the soft, tough ferrite occurs, followed by a zone of low carbon, but of considerably finer grain which likewise contributes to the increase of the notch toughness. Then follows the normal structure of almost pure pearlite which shows that it was a carbon steel with a little less than 0.9 per cent carbon.

In the foregoing merely the heating of steel has been discussed. It was assumed that this heating did not go up to excessively high temperatures. If, however, low carbon steel is heated sufficiently long at high temperature and that, according to E. Heyn, at temperatures above 1000 degrees Cent. it becomes extremely brittle, and then is called "overheated." According to Heyn and Bauer, a heating time of nine hours at 1100 degrees and seven and one half hours at 1200 degrees Cent. is necessary. Brittleness is more pronounced the higher the temperature and the longer the time of heating. Overheated steel breaks with a hammer blow especially if notched and the fracture generally shows the coarse grained structure following either the grain boundaries or the splitting faces of the crystal grains. The dimensions of the fracture grains, however, depend to a large extent on the manner of causing the fracture. A coarse fracture grain is, therefore, neither a sure characteristic of overheated iron, nor is a fine fracture grain definite proof that the iron has not been overheated. This can occur if the cooling from the overheated state takes place quickly. The brittleness of the iron created by overheating cannot be determined by the usual tensile test or bending test with gradually increasing load, but can be determined by impact loads, particularly by a notch impact test or notch bending test.

[45]The dangerous, pronounced growth of crystals in soft carbon steel which takes place at such low annealing temperatures (below the upper transformation point) after cold working, will be discused in the next chapter.

*Fig. 170—Coarse grained transformer sheet in cross section, etched microscopically*

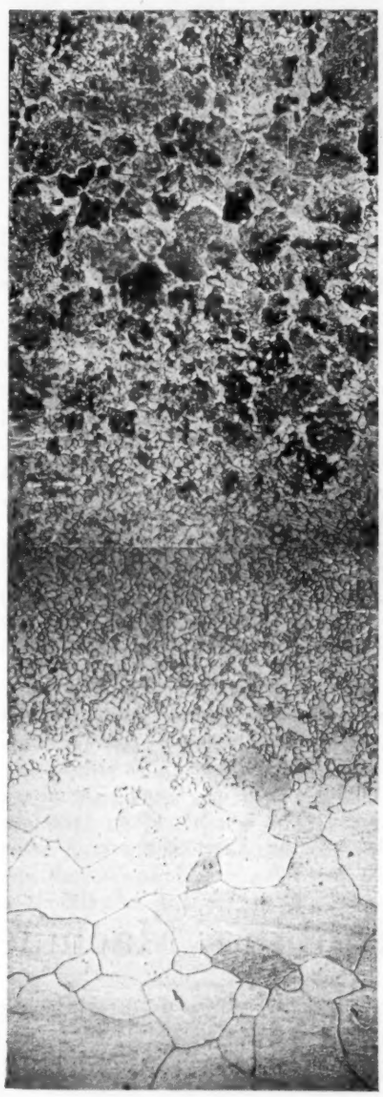


*Fig. 169—Cross section of flat steel with 0.85 per cent carbon; decarbonized at the edge and etched microscopically. X 75*

*Fig. 168—The same steel as Fig. 167 after 36 hours annealing. Etched microscopically. X 67*

By annealing at 900 degrees Cent., for one-half hour,[46] the overheated carbon steel can be restored. Then it again becomes fine grained and uniform and the brittleness disappears entirely. It can be improved further by mechanical working during cooling from the overheating temperature, since the large crystal grains are disintegrated by this procedure. This is indicated clearly by an examination of rivet steel with 0.23 per cent carbon.[47] While in the normally rolled material 7100 crystals occupied an area of 1 square millimeter, this number was reduced to 3200 after ten minutes heating at 1150 degrees Cent. and to 168 after two minutes at 1400 degrees Cent. By restoration (15 minute annealing of the overheated carbon steel at 900 degrees Cent.) the latter number rose to 17,500, which means that a considerable refinement of the grain had taken place here. In the same way, the number of grains was increased to 12,400 per square millimeter by forging of the overheated steel. This means that under certain conditions, the structure in the wrought rivet head can differ greatly from the unworked shank. Further, this over-

[46]The annealing temperature must be slightly above the upper transformation temperature and consequently depends on the carbon contents as Fig. 162 shows. For unalloyed steels the proper annealing temperature can be given if the carbon content is known. For alloyed steel, however, the transformation temperature must be determined. Compare section C, Fig. 80.

[47]S. H. Graf, Engineering, 1919, page 280; see *Stahl und Eisen*, Vol. 39, page 813, 1919.

*Fig. 171—Fine grained transformer sheet in longitudinal section, etched microscopically*

heated steel in the usual tensile test even shows a higher elastic limit (49.5 kilograms per square millimeter) and tensile strength (50.0 kilograms per square millimeter) than the normal or restored material for which the respective values were 32 and 46 kilograms per square millimeter its elongation had dropped to 4 per cent from 32 per cent, but increased again after restoration to 18 per cent.

According to Heyn and Bauer the following characteristics serve for determining overheating: Great brittleness which can be proved by notch impact or notch bending tests; a considerable decreases of brittleness does not occur on annealing one-half hour at 850 degrees Cent., but decidedly at 900 degrees Cent. or if the annealing is continued for a long duration of time at temperatures above 700 degrees and below 900 degrees Cent.; coarse structure of the fracture (judging with naked eye); coarse microstructure (on examination under the microscope).

If the annealing of low carbon steel is raised to about 1300 or 1400 degrees Cent., for a sufficiently long time, not only can a complete decarbonization, (especially in an oxidizing atmosphere) take place by burning the carbon, but also an oxidation of the crystal grains, at first at their surfaces, as can be seen in Fig. 172. The oxide layers disrupt the metallic cohesion of the crystal grains and the steel suffers a considerable reduction of its strength as well as a reduction of its toughness. In this state, the steel is called "burned." The burned steel cannot be restored, in comparison with steel which is only overheated, either by annealing or forging or by one of the many secret methods, because the oxides can no longer be removed from the iron. It belongs in the scrap pile and can only be used again by remelting in the open-hearth furnace.

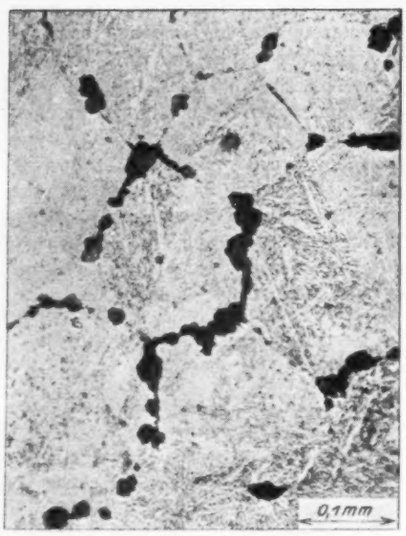



*Fig. 172—Burned steel, in cross section, etched microscopically. Shows dark magnetic iron oxide between the crystal boundaries. X 150*

## Methods for Making Gray Iron Diversified

(*Concluded from Page* 1053)

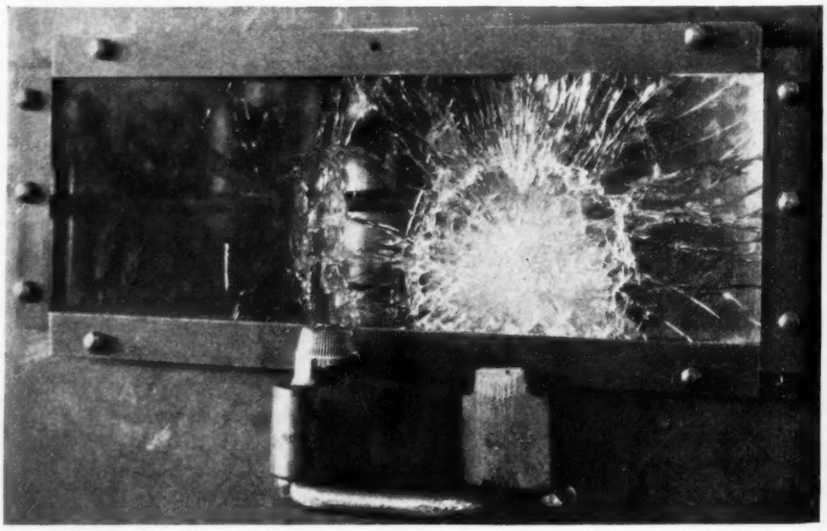
lowest melting point, it pours well because there are no free crystals in the molten mass, and the liquid solidifies without any auxiliary agency. A eutectic alloy therefore fills out the finest contours. After it has cooled this alloy exhibits the best strength qualities and the best conditions of structure to withstand friction and wear because the molecules are able to arrange themselves undisturbed in the state of equilibrium. There is thus no possibility of segregation of piping and the shrinkage is at a minimum.

Piwowarsky advocated the superheating of iron and referred to the time factor. It may be that this result was not due so much to the superheating as to the elimination of kish graphite, and consequently the reduction of the carbon content. Superheating would simply shorten the time necessary. It would appear that the time-honored adage of "Melt hot and allow the iron to stand" has now been given a scientific foundation. In the Deschene process the separation of kish and sulphur is assisted by the fact that the iron is kept hot and in motion, and thus the desired result is brought about in a minimum time.

The methods of producing high-test gray cast iron are numerous and considerable differences among them are to be noted. The resulting castings have much the same structure and properties, which points to some underlying general theory. The subject is still in a controversial stage, but it is evident that ways and means are now available for the production of better castings. Unfortunately the methods which have been proposed cannot be carried out without additional expense, but when it is considered that the quality of the product is made more uniform and certain, there should be no lack of interest on this account.

# Safety Glass on Hobbing Machine Protects Workers

TO PROTECT its workers against flying particles from the hob or mold case, General Electric Co., Pittsfield, Mass., recently installed a bullet-proof shield on a hobbing machine. Previously, the sight holes had been covered with expanded wire mesh which was found to interfere with visibility and which failed to afford complete protection. Since the installation of the bullet-proof glass, two serious accidents have been averted. On the last occasion, part of the hob, weighing 12 ounces and shown in the accompanying illustration resting on the right side of the handle, shattered the inside lamination of the glass but did not shatter the outside lamination.



# Noteworthy Technical Papers Mark A. F. A. Convention

## *Original Data from Elaborate Investigations Constitute Valuable Contributions to Foundry Literature—Next Meeting To Be in Cleveland*

JUDGED from all viewpoints, the thirty-third annual meeting of the American Foundrymen's association held last week in the Stevens hotel, Chicago, was one of the most noteworthy in the history of the organization. A technical program of a high standard, a representative although restricted exhibition and the convenience of having all functions under one roof and easily accessible contributed to the success of the whole.

In the opinion of many, the technical papers were more uniformly deserving of merit than in any previous convention. Several were outstanding in that they afforded original data resulting from thorough investigations on subjects extremely important to foundrymen. The paper on the influence of blast furnace practice on the quality of castings was an excellent example of this type of valuable contribution to the literature of foundry practice.

The shop courses in cupola practice and in steel foundry operation achieved a popularity far exceeding expectations. The roundtable discussions, wherein opportunity was given for informal consideration of foundry problems, again demonstrated their strong hold on foundrymen during the various convention sessions.

The next convention and exhibition will be held during the week of May 12, 1930, in Cleveland public auditorium. On behalf of the Foundrymen's International committee, Dr. S. G. Werner, president, Verein Deutscher Eisengiessereien, Dusseldorf, Germany, extended an invitation to attend the International Foundrymen's Congress in London in June. J. H. Whiting, chairman of the board, Whiting Corp., Harvey, Ill., was elected to honorary membership of the American Foundrymen's association. The report of the nominating committee was adopted unanimously at the business meeting of the association held Monday.

# Discuss General Problems of Foundry Industry

INTERESTING points in determining costs in gray iron and nonferrous foundries were brought out at the cost session on Tuesday morning. Two problems were passed out, one for the gray iron foundrymen and the other for the nonferrous members. The gray iron problem consisted of determining the cost on 100 pounds of gray iron castings using pig iron costing $22.40 per ton at the foundry, molding labor at $1.50, and core labor at $0.80. The work was molded on the bench and no profit was added.

These problems were collected and classified and it was found that the cost estimates ranged from $2.10 to $11 per hundred, with a spread of over $8 between the low and high. E. T. Runge, Cleveland, in his talk on "Practical Aspects of the Value of Foundry Cost Methods," presented his idea of a representative cost estimate on this same job. He figured the metal cost at $1.52, molding at $1.50, expense at $3, core labor at $0.80, core expense at $1.20, giving a total of $8.02 for the 100 pounds of castings.

Mr. Runge pointed out that costs could be divided into four divisions, namely molding, melting, cleaning and coremaking. He stated that numerous methods are used to determine cleaning costs, but that he had found the best results were obtained by charging the cleaning costs as a percentage of the molding labor. He stated that it is not accurate to figure cleaning costs on a weight basis, since it is the surface that is cleaned and that the surface is not necessarily a function of the weight.

### Varying Losses Noted

W. F. Graham, Ohio Brass Co., Mansfield, O., stated that comparative tests on different types of melting equipment showed that the loss when using oil-fired furnaces was 3½ per cent, when melting in crucibles 3 per cent and when using the electric furnace 1.35 per cent. These percentages were determined after recovering all salvage.

More than 300 foundrymen heard the discussion of problems of general foundry management and practice on Tuesday afternoon. E. K. Smith, metallurgist, Stockham Pipe & Fittings Co., Birmingham, Ala., presented a paper on the use of scrap in gray iron, malleable and electric steel mixtures. The paper, prepared by Mr. Smith and F. B. Riggan, associate metallurgist of the company, dealt with the economic situation surrounding the use of scrap. The authors concluded that in the future the processes and selection of materials must be under closer control, and they predict that scrap yards will be "equipped with briquette machines, balers, furnaces, magnetic separators and even chemical laboratories."

E. J. Lowry, Detroit, discussed the economic features of the scrap problem, and declared that in certain localities a differential of at least $3.50 to $4 between scrap and pig iron must prevail if scrap is to be

## New Officers

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Chevrolet Motor Co., Saginaw, Mich.
L. H. WRAY
Henry Wray & Son, Rochester, N. Y.

economical. His statement that at least two companies are using briquetting machines for borings and turnings prompted F. J. Walls, Wilson Foundry & Machine Co., Pontiac, Mich., to review briefly his experience with a machine of this kind. He declared that this equipment, which cost $40,000 and produces briquettes 4 inches in diameter, 3½ inches long, has proved satisfactory. He declared it paid for itself in six months.

In the final paper of the session, F. H. Elam, American Steel Foundries, Chicago, outlined safety considerations for foundries, emphasizing the need of instructing workmen in safe working practices.

Intense interest in materials handling was indicated by the attendance of more than 75 at the materials handling session Wednesday morning. Many small foundry companies were represented and in addition executives from the large automotive foundries and from equipment manufacturing firms contributed to the discussion.

### Foundry Practices Explained

In the absence of R. J. Heisserman, Link-Belt Co., Philadelphia, his paper tracing the history and development of mold handling was presented by J. J.Hartley of the Chicago office of the company. R. M. Scott, Packard Motor Car Co., Detroit, told of the reduction from 180 to 67 men in his plant due to the installation of proper handling equipment on one class of work and pointed out that this saving in labor had been accompanied by a reduction of 50 per cent in scrap losses.

J. E. Linabury, Oakland Motor Car Co., Pontiac, Mich., pointed out that mold handling is only a portion of the problem of transfer of materials in the foundry. The moving of castings through various operations, disposal of waste materials and delivery of cores all are important. In the new plant recently constructed under Mr. Linabury's direction, nine different types of conveyors are employed.

Albert Walton, consulting engineer, United Engineering & Foundry Co., Pittsburgh, read an abstract of his paper reviewing the general field of gray iron foundry handling and the economies of handling equipment in such service. D. B. Hill Jr., Palmer-Bee Co., Detroit, in a written discussion told of savings possible through the proper application of core oven handling machinery.

Many phases of foremanship training were covered in the session on that subject Thursday afternoon. Discussions centered on relative merits of the conference plan as against other courses and methods, frankness in foreman training as to company policies, training on company time, stimulation of foreman interest, inducing management to accept the training idea, and extension of training to apprentices. The general view was that training new men in the field should be done on company time.

It was pointed out by several that training should be after working hours in the smaller plants, and that sometimes overtime pay is involved with compulsory attendance, although others advocated voluntary attendance. The conference method, with or without supplemental texts, was shown to lead in acceptance.

W. F. Coleman, W. A. Jones Foundry & Machine Co., Chicago, in his paper stressed the importance of management sponsoring the training, and of competent teaching.

### Training Courses Discussed

Competition from without the industry was given as an important reason for furthering apprentice training work at the session on that subject Thursday morning. In a paper on "Why We Train Apprentices," J. A. Davies, Westinghouse Electric & Mfg. Co., Philadelphia, stated that the course was established at his plant to get better foundry work. He pointed out that for years science and the universities neglected the problems of the foundry industry, but that this condition now is changed with a result that the industry will benefit. In speaking of substitutes for castings he stated that the appearance of the welded structure in machinery is not anything like that of a gray iron casting. He believes that designers of machinery have been wafted along by the changing styles and now have gone too far toward welded structures.

F. A. Lorenz, American Steel Foundries, East Chicago, Ind., presented a series of charts to show some facts regarding the apprentice system in the East Chicago district. Data collected over a period of time show that the lowest turnover in apprentices is realized among boys having a higher education. Several of the men present expressed the desire to obtain boys with some high school education, but a few considered this impossible in their localities.

Considerable discussion resulted from a statement in Mr. Cornell's paper regarding the payment of piecework rates to apprentices when it becomes necessary to place them on that type of work.

## 300 Attend Dinner for Equipment Men

*APPROXIMATELY 300 manufacturers of equipment and supplies attended the annual exhibitors dinner on Monday evening in the ball room of the Stevens. The event was held under the auspices of the American Foundrymen's association and the Foundry Equipment Manufacturers association. Following the banquet, S. T. Johnston, president of the A.F.A. introduced H. W. Standart, president of the Foundry Equipment Manufacturers association, who spoke briefly on "The Function of Equipment in Foundry Practice." Dr. Siegfried G. Werner, president of the Foundrymen's International committee and president of the German Iron Founders association, expressed appreciation for the splendid reception accorded him during his visit to America, and extended an invitation to all to attend the International congress in London. H. Cole Estep, chairman of the international relations committee, told of plans for the European tour and introduced A. G. Swope, Thomas Cook & Son, who are handling the tour.*

# Operation Course Popular With Steel Founders

SEVERAL hundred steel foundrymen attended the various sessions devoted to problems of that branch of the industry. S. W. Utley, Detroit Steel Casting Co., Detroit, presided at the first of these, held Tuesday morning. A report of the joint committee on the effect of phosphorus on steel was presented by R. A. Bull, Electric Steel Founders' Research group, Chicago, who stated that work on physical tests of the bars made last year is progressing slowly and that at present insufficient advance has been made to draw any conclusions. However, according to a recent communication from Dr. Langenburg, announcement of some

results may be made at the June meeting of the American Society for Testing Materials.

David Zuege, Sivyer Steel Casting Co., Milwaukee, presented a paper on alloy steel castings which was discussed by A. W. Lorenz, Bucyrus-Erie Co., Milwaukee; K. C. Jones, Lebanon Steel Foundry, Lebanon, Pa.; A. H. Jameson, Deemer Steel Casting Co., New Castle, Del.; and C. E. Sims, American Steel Foundries, East Chicago, Ind. Following this discussion F. A. Lorenz Jr., American Steel Foundries, East Chicago, Ind., presented a paper on the grinding of steel castings in which he stated that through a careful analysis of grinding conditions, his firm was able to reduce its costs 30 per cent with the grinder making the same daily wage as in the old methods used. This paper was discussed by E. H. Ballard, General Electric Co., Lynn, Mass., and H. P. Evans, Pettibone-Mulliken Co., Chicago.

A. H. Jameson, Deemer Steel Casting Co., New Castle, Del., presented the report of the committee on steel castings. He said that the committee at this time does not believe it advisable to devise a number classification similar to that of the S.A.E. He also said that indications point to an adoption by the A.S.T.M. of a revision in its specification A95-28T on steel castings for valves flanges and fittings for high temperature service. If adopted, this revision will read as follows: "The steel may be made by the open hearth, electric or other processes approved by the purchaser," and which makes mandatory the chemical limitations which previously had been included in the specification merely as recommended practice, at the same time raising the sulphur limits from 0.05 to 0.06 per cent.

### Study Casting Porosity

Following the luncheon on Tuesday arranged for the steel foundry group 100 members and guests participated in a discussion on the causes of porosity in steel castings. R. J. Doty, Reading Steel Co., Reading, Pa., presided. The discussion was limited by consent to one particular type of porosity known as pin holes which are found just under the skin after annealing and machining the casting.

One foundryman stated that investigation of the cause proved to him that it was due to a metal condition and due to the metal not being worked thoroughly. Another said that he found it caused by metal being poured too hot and primarily due to a sand condition because it could be eliminated by changing the sand condition. According to another speaker, it was a metal condition and can be stopped by adding the silicon at the proper time, which he had determined as that point at which a slight boil occurred. Silicon added before or after this period may cause gas holes.

Over-reduced steel was another condition mentioned, and this was stated to be due to the ability of steel to absorb gases when molten, but which could not be retained when solidification took place. Reaction between iron oxide and carbon in the steel was suggested as another cause. The iron oxide and carbon react to form carbon monoxide which is retained by the metal until solidification takes place when it is ejected but not entirely. One member cautioned against careless addition of silicon, and stated that it should be added at a predetermined time before pouring which would be set by the capacity of the molding floor to take care of the metal. Unless this is done, the metal may contain oxides or gases.

The first session of the course on steel foundry shop operation was attended by about 50 steel men. C. N. Ring, Electric Steel Founders' Research group, Chicago, presided. F. A. Burtt, Pettibone-Mulliken Co., Chicago, gave a short talk on the types of ladles used in his plant. A basic lined teaspout ladle is used for pouring manganese steel, and a bottom pour type for pouring acid carbon and alloy steels. C. E. Wilson, American Steel Foundries, East Chicago, Ind., stated that his company employs bottom-pour ladles because a cleaner steel was obtained. He said that molds should be poured as fast as possible and that the thin and heavy castings should be poured first.

Relation of temperature and fluidity of molten steel was discussed by Mr. Zeuge, Sivyer Steel Casting Co., Milwaukee. He concluded that steels poured at the same temperature do not always possess a like fluidity. C. E. Mooney, Falk Corp., Milwaukee, exhibited a drawing to show his method of making up a stopper rod. He also showed a stopper head grinder made of silicon carbide.

### Permeability Test Expected

The Wednesday session of the steel foundry course was devoted to a discussion of core room practice. A. C. Jones, Lebanon Steel Foundry, was chairman. E. R. Young, Detroit Steel Casting Co., Detroit, stated that the tests for strength, moisture and green bond have been standardized by the American Foundrymen's association, and that considerable work has been done in developing a test for permeability. He believes that it will not be long before a device will be developed to permit permeability tests being made on the same machine that now is used to determine the permeability of molding sand.

In discussing the surface of cores, it was stated that the metal will lay better against a core having a good strong surface and a weak backing. D. Zeuge, Sivyer Steel Casting Co., Milwaukee, expressed the opinion that cracking depends on the thickness of the casting section. An interesting feature of the meeting was a discussion of continuous type core ovens by T. P. McVicker, Young Bros. Co., Detroit.

C. M. Saeger Jr., bureau of standards, Washington, described work that has been done by the department in experimenting with a rubber bond for foundry cores. He exhibited a number of samples in which rubber was used as a binder. At the close of the meeting, D. W. Merriman. Keystone Driller Co., Beaver Falls, Pa., told of using asbestos boards as core plates.

At the closing session of the course John Howe Hall, Taylor-Wharton

## Award Seaman Medal at Banquet

*IN INTRODUCING those at the speakers table at the banquet Wednesday evening President S. T. Johnston commented on the fact that a Chicago convention was greeted by a Chicago president. The directors and officers and directors elect were presented to a gathering of more than 400 who were present.*

*G. H. Clamer, past president of the A.F.A., for 20 years a warm friend and associate of the late Jesse Lee Jones delivered the presentation address in presenting the Joseph H. Seaman medal. This medal award was voted shortly before the death of Mr. Jones. Mrs. Jesse L. Jones, in receiving the medal, spoke with warm feeling of the high ideals which had governed her husband's work for the foundry industry.*

*Dr. S. G. Werner, chairman of the foundrymen's international committee and president of the Verein Deutscher Eisengiessereien, Duesseldorf, Germany, presented the greetings of his own association and the international committee. Following the banquet, a reception and dance was tendered by the association.*

Iron & Steel Co., High Bridge, N. J., presided as chairman. Heat treatment of steel was discussed by several authorities. Composition, size, design, service and specifications have much to do with the choice of heat treatment according to the speakers. With an increase of intercrystalline growth, an increase of impact resistance is noted.

Two heat treatments are necessary for obtaining the best physical properties and three treatments generally will produce better results. One speaker remarked that with each 100 degrees increase above the upper critical range, a doubling in speed of solution is noticed. Mention also was made with illustrations of the effect of aluminum additions on lowering of ductility of steel.

# Gray Iron Foundry Sessions Draw Crowds

THAT the quality of coke and amount of water in the blast constitute two of the most important variables that influence the quality of pig iron was emphasized in an extensive paper entitled "The Quality of Pig Iron and Castings as Affected by Blast Furnace Practice," presented at the Tuesday session on cast iron metallurgy by A. L. Boegehold, metallurgist, General Motors Corp., Detroit. This paper, unquestionably one of the best on the program of convention, was presented in abstract in last week's issue of IRON TRADE REVIEW.

A paper by Frank Hudson, Kilmarnock, Scotland, entitled "Science Hand in Hand with Labor," was presented at the session on iron founding practice on Wednesday morning. This was the annual exchange paper of the Institute of British Foundrymen, and in the absence of Mr. Hudson, it was presented by Oliver Smalley, New York.

### Cupola Operation Studied

F. B. Coyle, International Nickel Co., Bayonne, N. J., presented a study of a 36-inch cupola which was made with the idea of improving the quality of cast iron produced at the New York navy yard, Brooklyn, N. Y. As a result of this study, the author concluded that by careful analysis and control of cupola operation, it was possible to improve the tensile strength nearly 30 per cent and to maintain a brinell hardness between 200 and 220.

David McLain, Milwaukee, agreed with the author in regard to the height of the bed, which was given as 24 inches. Mr. Smalley took exception to this and stated he believes in a high coke bed, usually starting with 36 inches. Mr. McLain stated that he has found a bed of 18 to 22 inches the best for Connellsville coke and one of 22 to 26 inches the best for by-product coke.

In reply to a question regarding the proper order for charging steel, pig iron and scrap, Dr. Moldenke, Watchung, N. J. stated that he usually places the steel on the coke, then the pig and the scrap in order. However, he declared that the size of the steel sections governs its place in the cupola. J. D. Stoddard, Detroit Testing Laboratory, Detroit, called attention to a statement in the paper that sulphur was not affected by the amount of return scrap used. It was pointed out that this is not the case, but that the more returned scrap used in the mixture, the higher the sulphur in the iron.

"An analysis of 54-inch Cupola Performance" was the subject of a paper presented by Edward E. Marbaker, Whiting Corp., Pittsburgh. The author presented detailed information on the operation of 16 different cupolas, eight straight line and eight boshed in the melting zone.

## Discuss Instruction for Foundrymen

*TWENTY professors and instructors of foundry practice representing many of the leading engineering colleges met at a dinner Monday night, under arrangements made by R. E. Kennedy, technical secretary of the A.F.A. Prof. J. D. Hoffman, Purdue university, Lafayette, Ind., who presided, outlined the intentions and opportunities for service available to men instructing students in foundry fundamentals. D. M. Avey, editor,* THE FOUNDRY, *spoke on the need for attracting intelligent young men into the foundry field and urged greater attention to collegiate education directed toward the foundry field and broader opportunities made available for such men.*

*John W. Bolton, Lunkenheimer Co., Cincinnati, in a brief address, touched upon the desirability of a better understanding of the engineering properties of castings in general. Prof. Scott Mackey, University of Wisconsin, Madison, Wis., outlined the work being done by the institution he represents and the effort to interest manufacturers in the class of men educated in fundamentals of foundry practice.*

Considerable interest was displayed at the session on high test cast iron Thursday afternoon, at which Dr. H. F. Moore, University of Illinois, Urbana, Ill., presided. The annual exchange paper of the Association Technique de Fonderie, France, which was prepared by R. P. Lemoine, French Foundry Technical association, Paris, France, on the subject "High Test Cast Iron," was discussed by R. S. McCaffery, University of Wisconsin, Madison, Wis., in the absence of Mr. Lemoine.

The manufacture of alloyed cast irons in France is discussed and the various melting processes described. The author concludes that a sound basis of production of high test cast iron has been the semisteel process; that the development of the electric furnace in foundries has given place to the single and duplex processes which permits adopting compositions of low carbon and high silicon; and that the careful study of melting scrap in cupolas for the duplex process coupled with the knowledge that some kinds of scrap have a slow carburization have resulted in the establishment of an interesting cupola process.

### Outlines Developments

E. E. Marbaker, Whiting Corp., Pittsburgh, presented a paper outlining developments in high test cast iron. He stated that since the paper was written, he had found a new method that was being used in Germany. The metal is melted in a kiln type furnace called the Brackelburg furnace and fired with powdered coal. It is charged and fired from the same end and tapped from the middle. The metal is melted, not by the heat of combustion directly but by the heat reflected from the walls of the furnace. This furnace, when the metal first is charged, is rocked until the metal is melted and then rotated completely. A slag is formed that protects the metal from the flame and keeps the sulphur in the flame from being absorbed by the metal.

Fritz Meyer, National Radiator Corp., Johnstown, Pa., formerly connected with Dr. Piwowarsky in Germany, gave the European view of

American foundry practice. He also told of the various methods for producing and some of the advantages of high test iron.

F. B. Coyle, International Nickel Co., New York, explained the use of nickel and chromium alloys in cast iron. He explained Maurer's diagram and discussed Piwowarsky's results in the production of high test cast iron. R. S. MacPherran, Allis-Chalmers Mfg. Co., Milwaukee, presented some data on the production of alloy cast iron at his company's plant.

H. Bornstein, Deere & Co., Moline, Ill., gave results he had obtained in the production of high test cast iron in various sized cupolas.

### Hundreds Attend Cupola School

Factors entering into a formula for determining the proper area of gates in relation to castings provoked prolonged discussion at the first session of the gray iron foundry course held on Monday. H. W. Dietert, United States Radiator Corp., Detroit, explained a formula he had developed for regulating the size of the gate. It is based on the pouring time and is calculated from the weight of the casting, thickness of section, total area and height of the pouring head. In the ensuing discussion it developed that other factors frequently had to be considered. The proposed formula gives the total area of the passage required, but in the majority of cases several small inlets must be provided to distribute the metal properly and the individual area of each of these inlets and their location depends on local conditions. As an extreme instance of this kind Dr. Moldenke pointed out that a ladle with 14 spouts was employed to pour long pipes horizontally in a southern foundry. E. W. Smith, Crane Co., Chicago showed how the location of the gates exerts an important influence in securing straight castings.

At the Wednesday session discussion of the materials used in the cupola, pig iron, scrap, steel fluxes and coke provoked comment over a wide range of details. David McLain, Milwaukee, stated that originally only pig iron and steel scrap were employed in the proportion of approximately 75 per cent pig iron and 25 per cent steel to make semisteel, but that now a great many combinations are employed. He declared that steel still is the necessary foundation of all cast iron mixtures in which high strength is a requisite. Sections of steel rails cut to suitable lengths to suit the inside diameter of the cupola are the most satisfactory for handling and perhaps other reasons, but any kind of steel scrap will serve. Thin plate scrap may be employed if the blast pressure is reduced. With a high blast, thin steel will be lost through oxidation. He stated that stove founders now are using 10 per cent steel in their mixtures. A hot cupola at the beginning of the heat is a prime requisite in semisteel melting.

G. S. Evans, Mathieson Alkali Co., New York, stated that the object of introducing flux into a cupola is to improve combustion and help wash impurities from the metal. The amount of limestone necessary to properly flux a cupola depends on the character of the coke in the charge and the amount of lime in the limestone. Limestone in which the insoluble silica exceeds 5 per cent is not suitable for cupola fluxing purpose. Limestone should be placed in every charge, preferably on the coke, commencing with the bed.

E. J. Lowry, Detroit, described the manufacture of pig iron and pointed out the futility of expecting uniform iron from widely separated stacks operating under widely different conditions. He also referred to the advantages of using small pigs.

J. W. McKenzie, American Cast Iron Pipe Co., Birmingham, Ala., explained that chemical composition of coke, physical properties and lump size play an important part in melting, also in determining the carbon content of the resulting metal, especially in mixtures where steel is employed.

According to F. K. Viall, Griffin Wheel Co., Chicago, who participated in the discussion at the final session of the course, coke seems to have monopolized most of the attention in cupola discussion, when in reality two elements coke and air are equally important. With the aid of a series of tables and illustrations he demonstrated the theory of combustion to secure the most satisfactory results. He strongly advocated taking gas analysis to determine the melting conditions inside the cupola. In answer to a question from the floor he recommended taking the test gas from a point at the charging door sill. The relation of CO and $CO_2$ is the real key to cupola operating efficiency and always should be watched closely.

C. J. Scullin, deplored the tendency of many cupola operators to neglect proper lighting. A cupola properly lighted means a smoothly running heat, while fire improperly started will cause unsatisfactory conditions throughout the duration of the heat.

# Malleable Foundrymen Look for Shorter Annealing Cycle

PROMINENT among the subjects discussed during the Thursday morning and luncheon sessions on malleable shop practice was the always popular question of annealing time. H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland, and W. R. Bean, Grindle Fuel Equipment Co., Harvey, Ill., described methods and equipment recently developed by the Industrial Furnace Co. and the General Electric Co. for reducing the annealing time for malleable. In the first method the cycle requires about four days while in the second the period has been reduced to 24 hours.

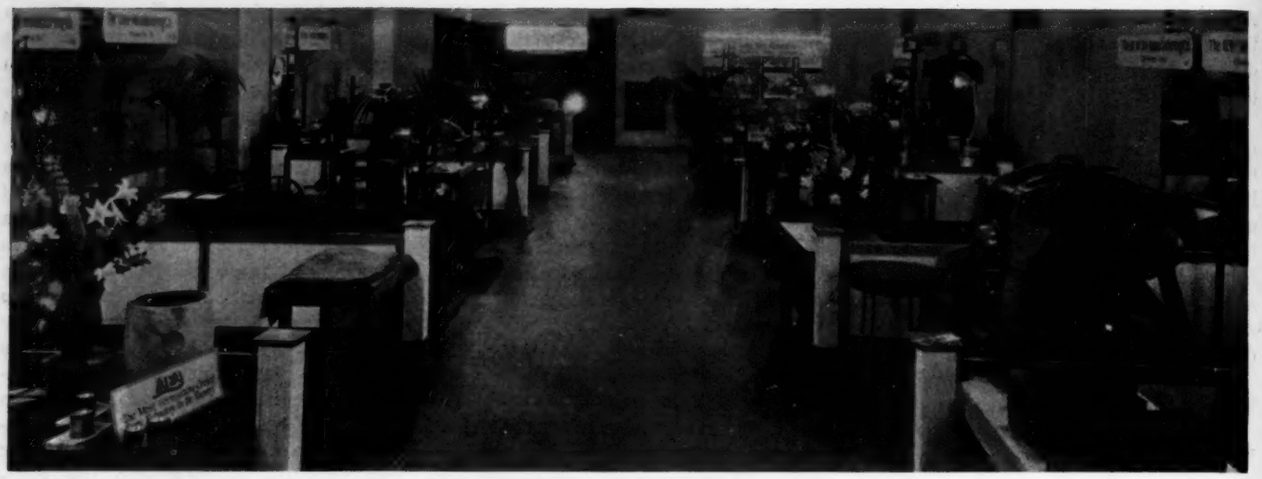
Shortening of time in both instances is accomplished by raising the temperature rapidly at first, holding it for a definite period and then reducing it. In the first instance this is done slowly, thus accounting for the four-day cycle. In the General Electric method the castings are raised to a temperature of 1850 Fahr. in about 12 hours, held at that temperature for 3 hours, then during a period of 6 hours the castings are reduced in temperature below the critical range. During this stage the temperature is raised three times to about 50 degrees higher and then the castings are allowed to cool. It is claimed that these three "kicks" accomplish the desired result.

Frank J. Lanahan, Fort Pitt Malleable Iron Co., McKees Rocks, Pa., presided at the morning session. Duncan Forbes, Rockford-Northwestern Malleable Iron Co., Rockford, Ill., presented a paper, "Practical Aspects of White Fracture Malleable Iron," in which he showed that this condition can be avoided by maintaining silicon under 1.00 per cent and the phosphorus under 0.17 per cent. Melting operations should be normal and excessive annealing temperature should be avoided, he declared. The oven should be pulled at 1000 degrees Fahr., and the castings should not be reheated to over 850 degrees Fahr.

Scott Mackay, University of Wisconsin, Madison, Wis., chairman of the division of malleable iron foundry practice, presented a short report on the aims of the division.

A paper entitled "Controlling the Atmosphere in Malleable Annealing

(*Continued on Page* 1069)



*General view in one of the aisles in the foundry exhibition hall in the Stevens hotel*

# Foundrymen Find Condensed Show Representative as Ever

APPROXIMATELY 150 manufacturers participated in the exhibition of foundry equipment, materials and supplies held April 8 to 11 at the Stevens hotel, Chicago, in conjunction with the thirty-third annual meeting of the American Foundrymen's association.

The setting for the show was decidedly different from that of any of its predecessors. All exhibits were in one room, conveniently centralized and somewhat restricted in space as compared with other exhibitions. The result was that while manufacturers of bulky equipment were obliged to display their wares by means of models or illustrations, and extensive demonstrations were impossible, still the show was as representative as in past years. It did not suffer from the lack of variety, and as a matter of fact, visitors interested in foundry equipment and supplies were able to observe everything at the expense of fewer steps and less time than ever was possible before.

These factors of convenience were appreciated by those who attended the show. Registration on the opening day was 1600, a remarkably high figure, and at the end of the last day it was estimated that at least 3500 had viewed the exhibits.

The outstanding tendency as reflected by the equipment displayed is the increasing dependence on mechanical devices for handling materials and work in the foundry. This was reflected in units for every department.

## Exhibits Reflect Trend Toward Mechanization

SEVERAL new developments in molding machines were shown for the first time. These included a shockless jar ram, squeezer type, molding machine with a flask lifting device, exhibited by the Tabor Mfg. Co., Philadelphia. This machine has a heavy steel column to support the squeezer head and prevent springing. A departure from usual practice is the employment of heat-treated aluminum castings for the supports on the jarring mechanism. The firm also showed a core blowing machine, a hand-ram, rollover core machine with an automatic leveling clamp and pattern draw, and a post type, jar-vibrator, portable molding machine.

The Herman Pneumatic Machine Co., Pittsburgh, exhibited a new ½-ton capacity, jar-rollover and pattern drawing machine. The platen extends out from the machine and the rollover mechanism is reversed, as compared to the older type machines. A smaller jar stripping-plate molding machine also was shown.

### Show Drag Plate Molding

Stationary and portable jolt squeeze molding machines, and other molding equipment, such as snap flasks, slip flasks and steel jackets, were exhibited by the Adams Co., Dubuque, Iowa. The Wadsworth Core Machine & Equipment Co., Akron, O., featured steel reinforced core and bottom plates, equipment for a special method of molding known as drag plate molding, and sand and core testing equipment. A core blowing machine with a number of cores produced on that type of machine were shown by the Wm. Demmler & Bros., Kewanee, Ill.

Several different types of molding machines were displayed by the Wm. H. Nicholls Co. Inc., Richmond Hill, L. I., N. Y. These included portable jolt squeezers, with and without pattern draw, and a large jolt squeeze, rollover machine with pattern draw. The Osborn Mfg. Co., Cleveland, exhibited a jolt squeeze, rollover, pattern drawing molding machine, a jolt squeeze machine and a core machine. The rollover molding machine was equipped with roller conveyors to

transport the flasks to and from the machine.

The Arcade Mfg. Co., Freeport, Ill., showed a heavy duty, portable type, molding machine, a jolt rollover core machine, and a jolt squeezer machine. Molding and core making machines were featured by the International Molding Machine Co., Chicago. The Moline Iron Works, Moline, Ill., displayed a squeezer type molding machine, and the exhibit of the Beardsley & Piper Co., Chicago, consisted of photographs of sand slinging machines which have been installed in various foundries.

Core ovens and core oven equipment were displayed by a number of firms. These included the Swartwout Co., Cleveland, which showed a gas-fired oven; Young Bros. Co., Detroit, which exhibited an electrically heated oven, and the Paul Maehler Co., Chicago, which displayed gas fired, core oven heaters and temperature control equipment. The Foundry Equipment Co., Cleveland, showed photographs of core and mold oven installations including the rolling drawer, portable rack, car and conveyor types.

Cupola blowing apparatus was displayed by the Spencer Turbine Co., Hartford, Conn. The exhibit included a 20-horsepower turbine blower for cupolas and a 3-horsepower turbine blower for supplying air for oil and gas burners, and other industrial heating equipment. The General Electric Co., Schenectady, N. Y., showed its cupola blowing apparatus which consists of a centrifugal blower equipped with an automatic device to insure a constant weight of air to the cupola.

### Display Melting Equipment

Melting equipment and refractories were shown by several companies. The Detroit Electric Furnace Co., Detroit, had in operation under a dummy load, a 100-kilowatt electric furnace. The Ajax Electrothermic Co., Trenton, N. J., exhibited a wooden model of its 300-pound coreless induction furnace for melting steel and nonferrous metals. Photographs of electric furnace installations with castings made from metal melted in its furnace featured the display of the Pittsburgh Electric Furnace Co., Pittsburgh. Refractories made of graphite, such as crucibles, nonferrous furnace lining materials, nozzles, plastics, etc., were shown by the Lava Crucible Co. of Pittsburgh, Pittsburgh, and the Joseph Dixon Crucible Co., Jersey City, N. J. The Whiting Corp., Harvey, Ill., featured a unit type coal pulverizer for industrial furnace use and photographs of miscellaneous foundry equipment.

Linde Air Products Co., New York, and the Air Reduction Sales Co., New York, exhibited tanks of oxygen and acetylene, carbide, carbide lamps, and apparatus for cutting and welding. Instruments for determining temperatures and sand testing were displayed by the Pyrometer Instrument Co., New York; Illinois Testing Laboratories Inc., Chicago; and Harry W. Dietert, Detroit. The International Nickel Co., New York, exhibited a painting showing the application of nickel to steel, gray iron and brass. The company also displayed a cross section of an automobile cylinder block made from nickel cast iron. Typical fractures of pig iron and castings made from mixtures containing a natural, chromium-nickel bearing pig iron were shown by the Bethlehem Steel Co., Bethlehem, Pa.

Brass, bronze, aluminum and aluminum alloy ingots, shot and castings were shown by the Ajax Metal Co., Philadelphia; British Aluminium Co. Ltd., New York; and Alloys & Products Inc., Bronx, N. Y. Foundry coke was featured by the Semet-Solvay Co., New York, and the Indiana Consumers Gas & By-Products Co., Terre Haute, Ind. The Federal Foundry Supply Co., Cleveland, displayed core binders and other foundry supplies and its sand testing equipment.

Machinery designed to solve practically every material handling problem in the foundry industry was one of the interesting features of the exhibition. Trucks, cranes, hoists, monorails, conveyors, buckets, pouring devices and numerous other types of handling equipment were on display at various booths in the exhibition hall. The Northern Engineering Works, Detroit, showed a low-head, 5-ton crane trolley and a 1-ton hoist mounted on a structural steel runway. A similar hoist, designed for high lifts, was supported on a stand to permit close inspection.

The American Engineering Co., Philadelphia, operated a 2-ton electrically-driven hoist on an overhead beam. A second unit of similar design was displayed from the floor. A 1-ton, single I-beam, electric hoist was featured by the Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y. Photographs and drawings of other material handling equipment also were shown by the company. The Milwaukee Electric Crane & Hoist Co., Milwaukee, displayed a roller bearing crane trolley of a type adapted to foundry installation.

An electrically-operated pouring device and several types of hoists and trolleys were operated on monorail equipment by the Louden Machinery Co., Fairfield, Ia. The Yale & Towne

*All exhibits representing apprentice training contests and committee activities were grouped*

*A variety of exhibits featured the foundry show*

Mfg. Co., Stamford, Conn., exhibited an industrial lift truck, a 1-ton power driven trolley in operation, a ¼-ton electric hoist, a 1-ton spur geared chain block, a similar block of the screw gear type, and several units with parts cut away to show the important construction features. The Modern Pouring Device Co., Port Washington, Wis., operated a new type of electric pouring device. Numerous types of chain and electric hoist featured the display of the Chisholm-Moore Hoist Corp., Tonawanda, N. Y.

Several sections of standard heavy and extra heavy duty roller conveyors for handling molds, castings and other foundry materials, were exhibited by the Mathews Conveyor Co., Ellwood City, Pa. The Clark Tructractor Co., Battle Creek, Mich., operated a 3-ton lift truck and an industrial truck for picking up and handling bulk materials. Storage battery trucks of the low and high lift types, were shown in operation by the Automatic Transportation Co. Inc., Buffalo. Blaw-Knox Co., Pittsburgh, featured a clam shell bucket and small samples of a steel grating especially applicable to foundry use. Buckets also were shown by the Hayward Co., New York, and G. H. Williams Co., Erie, Pa.

Several displays were devoted to mold and sand handling systems. C. O. Bartlett & Snow Co., Cleveland, exhibited sections of a mold conveyor, apron conveyor, belt conveyor idlers as well as illustrations of installations. Photographs of foundry handling installations were shown by the Chain Belt Co. Milwaukee, R. W. McIlvaine Co., Chicago, and Link-Belt Co., Chicago. The latter company also exhibited a vibrating screen for foundry sand, a speed reducer and samples of various types of chains.

Cleaning room equipment of various types attracted considerable interest at the show. The Pangborn Corp., had an artistic booth arranged with large colored photographs of the barrel type and table type sand blast units for a background. The company also showed a 4-screen dust arrester section and a sandblast helmet. The New Haven Sand Blast Co., New Haven, Conn., showed a small pressure sandblast barrel and dust arrester equipment. A complete machine for sandblasting and tumbling castings was featured by the American Foundry Equipment Co., Mishawaka, Ind. This company also displayed a tapered slip flask, pouring jackets and other equipment. The W. W. Sly Mfg. Co., Cleveland, had an interesting installation of a unit for reclaiming used molding sand. Photographs and drawings showed installations of other types of foundry machines including sandblast and dust arrester equipment. A completely equipped sandblast machine, a small sandblast barrel and a model dust arrester were exhibited by the MacLeod Co., Cincinnati.

### Many Grinders Exhibited

Manufacturers of grinding equipment were well represented. A variety of grinding wheels were shown by the Carborundum Co., Niagara Falls, N. Y. The Kling Bros. Engineering Works, Chicago, operated several floor-type grinders equipped with rubber bonded wheels made by the Manhattan Rubber Co., Passaic, N. J. The Norton Co., Worcester, Mass., showed various types of grinding wheels and a floor type grinding stand designed for high speed grinding. Six large direct motor driven grinders were placed on exhibit by the United States Electrical Tool Co., Cincinnati.

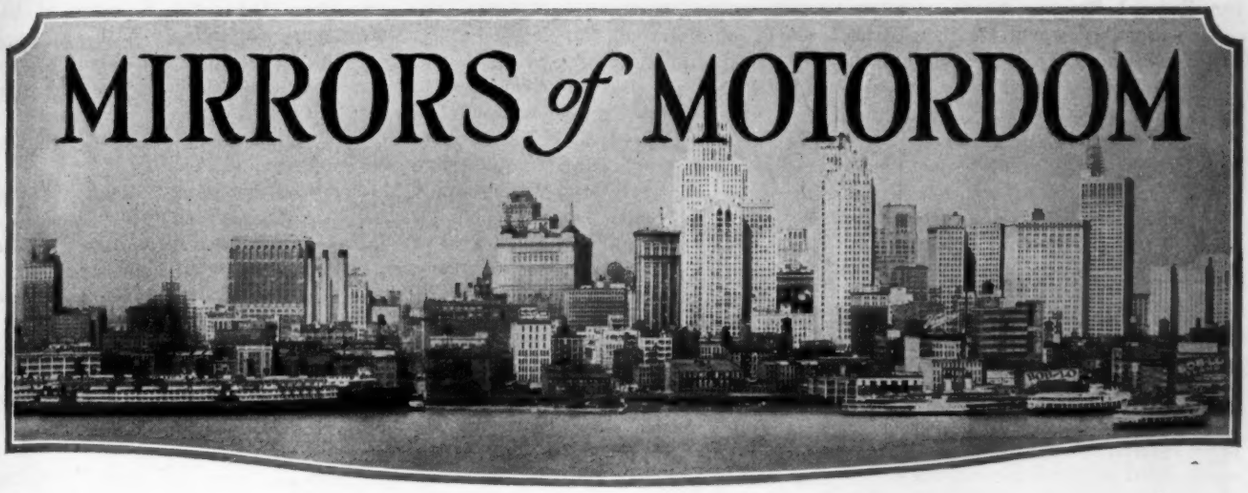
Special high speed grinding wheels and a variety of smaller wheels for snagging castings were displayed by the Abrasive Co., Philadelphia. The Safety Grinding Wheel Co., Springfield, O., exhibited a large floor type grinding machine and specially bonded wheels for high speed grinding. A high speed floor type grinder and a swing frame grinder were operated by the Marschke Mfg. Co., Towson, Md. Portable pneumatic tools were shown by the Dayton Pneumatic Tool Co., Dayton, O. These included chippers, riveters, sand and bench rammers, etc. The Buckeye Portable Tool Co., Dayton, O., exhibited a line of portable pneumatic grinders and other tools.

Speed reducers were shown by the W. A. Jones Foundry & Machine Co., Chicago. A new type of tumbling barrel was shown by the Whiting Corp., Harvey, Ill. The barrel was driven by an electric motor through a reducer made by the W. A. Jones Co.

The importance of proper sand preparation in modern foundry operations resulted in considerable attention being paid to sand mixing and preparing equipment. The Royer Foundry & Machine Co., Wilkes-Barre, Pa., exhibited three models of its line of sand separating and blending machine. The Deister Concentrator Co., Ft. Wayne, Ind., operated a foundry residue reclamation plant for brass foundries and showed a special type of foundry screen. The National Engineering Co., Chicago, showed a laboratory size muller type mixer and photographs of installations. A sand throwing machine for blending and mixing foundry sand was featured by the Axmann Sand-Throwing Machine Co., Cleveland. The Great Western Mfg. Co., Leavenworth, Kans., displayed two gyratory type

(*Concluded on Page* 1069)

***Each booth was restricted in size, compared with those in previous shows***




# Press for Spot Steel, but Restrict Future Buying

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# High Land Values to Veer Detroit Steel Industry?

*Detroit, April* 16

THIRTY days ago it was heresey for anyone associated with the automotive industry to speculate how long it could maintain its record rate of production. Today the "best minds" of the district are doing it, and with the calm assumption it is the prudent, logical thing to do.

There is a rather general sentiment that automobile production is at or is passing its crest. At the moment, pressure for steel—chiefly bars, sheets and strip—is undiminished. Producers continue to lose business because they cannot make immediate shipment. But compared with a month ago, automotive buyers of steel are not protecting themselves quite so far ahead.

Record first quarter production of automobiles will prove to have one of two effects upon the second quarter: Either it has bequeathed a momentum that will carry the new quarter through on a high plane, or it has anticipated second quarter demand to such an extent production will fall off sharply. Opinion today almost unanimously favors the former.

February and March shipments of steel to automotive consumers for the assembly of March and April cars and trucks far surpassed all previous heights. April shipments are expected to show little deviation from those of March. At this distance, May, June and July shipments seem likely to develop recessions.

Unwillingness of automobile manufacturers to commit themselves for third quarter pig iron and steel is in itself no bearish indication. Usually it is late May before the third quarter begins to shape up, and the record output of passenger cars and trucks may incline some interests to be cautious until the outlook for the last half is reasonably clear.

* * *

AS FORECAST a fortnight ago, March production of automobiles, while a record for all time on a monthly basis, scarcely bettered the daily rate of February. While the steel industry holds to the daily rate as the most accurate gage of production, the automotive industry continues to look to monthly totals.

February's 466,084 passenger cars and trucks figured out to a daily average of 194,200 units. The national automobile chamber of commerce has estimated March output at 535,000 units which, shorn of foreign assemblies by domestic makers, simmers down to about 500,000 units. Thus the March daily average approximated 192,300 units. Late in March the schedules of some makers were curtailed, but early in April the rate rebounded, and with half the month gone April promises to approximate the March rate.

* * *

IT CONTINUES true that so long as Ford and Chevrolet, accounting for a little more than half of all automobile production, pound along at 6500 to 7000 and at 6000 to 6500 units, respectively, every day, there will be no return to past levels. Both these interests still are seeking to expand their rates, and if domestic sales only are considered, the lead of Ford over the Chevrolet six is negligible.

Hudson-Essex holds at 1700 to 1900 units daily, approximately the rate which gave it a total of 44,295 for March. Oakland-Pontiac, which produced nearly 40,000 units in March, continues at about 1400 daily, paralleling Willys-Overland. Oldsmobile, meeting heavy demand for its six and stocking its dealers with the new Viking, is producing 15,000 units this month.

Graham-Paige is operating at a rate that will net about 10,000 cars this month, Reo at 5500, Hupp at 5000 and Packard at 4500. Buick and Chrysler continue the soft spots. Buick turned out 15,000 units in March and considering that its new Marquette is swinging into production, will better that total considerably this month. Chrysler statistics include 550 DeSotos daily, with the April Dodge schedule about 40,000.

* * *

WALL Street and the weather are the chief influences this month upon retail selling. The squeeze in the former cannot help but react unfavorably, chiefly upon the higher-priced cars. As a rule, however, whatever retards the sale of Packards also tightens the purse strings of the man about to buy a Chevrolet, and there is little applause here

for Federal Reserve board members.

Unseasonably warm weather in the first few days of April has had a stimulating effect on retail sales, especially in the north central region, and in some districts the season is advanced 30 days. This may move stocks in manufacturers' hands but will have more effect upon May than upon April production schedules.

* * *

HERETOFORE, General Motors cars have been largely noncompetitive. Chevrolet, Pontiac, Oldsmobile, Oakland, Buick, LaSalle and Cadillac have represented consecutive price ranges. Now, however, they are coming out of their compartments.

The Viking eight, which Oldsmobile introduced April 13, is squarely in the Buick class. The Marquette, projected running-mate of Buick, will invade the Oldsmobile-Oakland sector. Special equipment on the Chevrolet brings it close to the precincts of the Pontiac, which in turn practically overlaps Oldsmobile. The latter in turn closely approaches Oakland, and Oakland is in direct competition with the smaller Buick.

In the past, General Motors has had only one car to offer to a purchaser in a stated price class. The competition was between one General Motors car and possibly four or five so-called independents. In the future General Motors will have two or more cars to proffer. It is a sign of the stiffer competition which will mark the last half of this year.

* * *

DETROIT'S determination to build up a steel industry commensurate with the requirements of its automotive plants is surviving even the sale of what is said to be the last available industrial site on the American side of the Detroit river, adjacent to the city, at a reported $35,000 an acre.

The river front below Detroit, providing both an adequate water supply and dock facilities for raw and finished materials, has always been visualized as the seat of a steel industry. But at $35,000 an acre, the carrying charges on a 150-acre site for a plant with an annual output of 300,000 tons would be $1 per ton, to say nothing of taxes in proportion.

Property in from the river is available at a lower price, but the only stream affording a water connection near Detroit is the River Rouge, and the few acres along it are closely held. The Rouge now accommodates the two Ford ore carriers, among the largest on the Great Lakes, but its length is limited and it would require many millions to transform it into the artery of a second Gary.

* * *

ACROSS the Detroit river, ten to fifteen miles from downtown Detroit as the crow flies, is much undeveloped property. Land values and taxes are relatively low, water supply is ample, the labor supply could be augmented without the handicaps of restrictive immigration, and iron ore, coal and coke could be brought in without any tariff imposts.

But in the middle of the Detroit river rises a formidable though intangible barrier—the American tariff. On full finished steel sheets at the present market price the duty would be $16.40 per net ton, not including assessments on the extras, and on soft steel bars $10 per ton. Steel being sold into the Detroit district on Pittsburgh, Chicago and Cleveland bases, with freight rates of 29, 27½ and 23½ cents per 100 pounds, respectively, some of this duty would be offset, but scarcely enough to warrant building up an industry in the border section.

At least the United States Steel Corp., with many acres at Ojibway, ten miles from Detroit, has not progressed beyond a small wire plant, the shells of two blast furnaces and a start on concrete ore docks and bins.

* * *

DETROIT claims to have both the market and the money for a steel industry. When George Fink, of the Michigan Steel Corp., set out to finance his Great Lakes Steel Corp. open hearths and strip mill at Ecorse, eight miles from Detroit, he asked for only $20,000,000 but was compelled to ration his common shares. There is Fisher Body money in the sheet mill the Newton Steel Co. is putting up at Monroe, Mich., thirty miles distant. Any reasonable project can be readily financed.

An important interest estimates that the automotive plants of the greater Detroit district consume annually 2,500,000 tons of bars, plates, forging billets and other heavy products, 2,000,000 tons of sheets and 1,000,000 tons of strip. This is a total of 5,500,000 tons, exclusive of wire, etc. The IRON TRADE REVIEW analysis of consumption of finished rolled steel in 1928 allocated 6,330,588 tons to the automotive industry, and Detroit's share, about 90 per cent, would be 5,700,000 tons. This substantiates the estimate.

Against this steel requirement, approached in this country only by the greater Chicago district, the Michigan Steel Corp. last year rolled 100,000 tons of sheets. The Detroit Seamless Steel Tubes Co. is rated at 30,000 tons annually. With a small amount of strip cold rolled by the Detroit Steel Corp., this comprises the district's output. The Ford Motor Co. annual output of 200,000 tons is nonmerchant.

The proposed Great Lakes plant at Ecorse is rated at 400,000 tons, and the new Newton mill at about 100,000 tons. The Steel & Tubes division of Republic Iron & Steel Co. is shortly to open its plant in a suburb.

About 700,000 tons of the best steel scrap available is shipped out of Detroit annually. In 1928 exactly 36,552,791 tons of iron ore passed down the Detroit river.

There is some speculation whether the automotive industry, having developed the domestic market and now getting the export situation in hand, will next turn its hand to the production of steel in this district—unless the steel industry itself pre-empts the field.

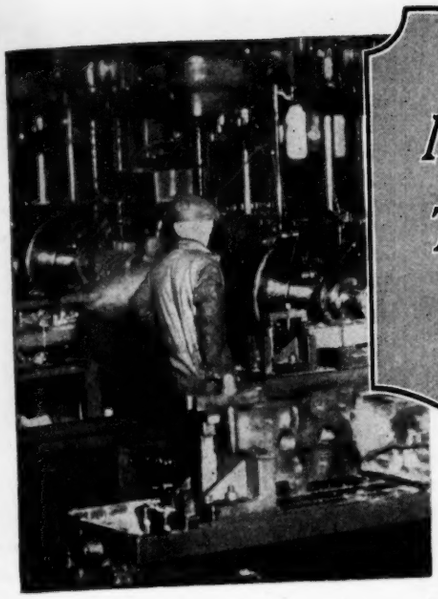
An unconfirmed rumor credits a large automotive interest with planning to construct a fully integrated blast furnace and steelworks plant in this district. Another report is that an Ohio steelmaker is to invade the district. It will be recalled that last fall there were reports of General Motors planning blast furnaces and a steelworks in the Saginaw district; at the last session of congress $50,000 was appropriated for work on the Saginaw river and $34,000 for River Rouge.

* * *

A LOSS of $105 to $110 per car was taken by the Ford Motor Co. in 1928, judging from the report filed by the company with the Massachusetts commissioner of corporations. As of Dec. 31, 1928, the surplus and reserves of the company totaled $587,744,219, a shrinkage of about $80,848,873 from the $668,593,092 of one year previous. This loss may be distributed over approximately 750,000 units. One analysis indicates that in 1927 and 1928 losses attributed to bringing out the new model approximated $150,000,000.

The balance sheet of the Ford company as of last Dec. 31 places real estate at $156,239,207, almost identical with the year previous. Machinery and equipment are set down at $152,921,366, against $144,821,503 at the close of 1927. Inventory last Dec. 31 aggregated $102,773,704, compared with $72,177,674. Cash, including receivables, securities and patent rights, amounted to $275,926,656, compared with $367,616,872 on Dec. 31, 1927.

In 1927 and 1928 the company seems to have lost $65,000,000. In 1926 its profits were $75,270,000, in 1925 $115,078,000, and in 1924 $115,105,000.



# New Machine Tools and Shop Equipment

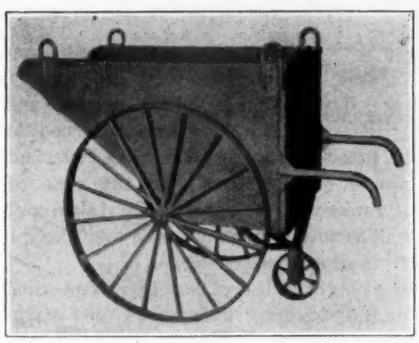
"Without tools man is nothing, with tools he is all."—Carlyle

## Shop Truck for Carting Loose Material

No. 85

Pittsburgh Producers Supply Co., 821 Allegheny avenue, Pittsburgh, recently has placed a shop truck on the market designed for use as a nail buggy between the various departments of nail mills, and also for work in other industrial plants where heavy, loose material is to be moved in bulk. The truck has a rated capacity of 1500 to 2000 pounds. The body is 36 inches long, 24 inches wide, 24 inches deep at the maximum depth. It is mounted on two 30-inch wheels and one 8-inch pilot wheel having a 2 x ¼-inch tread.

Wheels and body are made entirely from steel sections welded together. The body is made in five



*No. 85—Newly designed shop truck*

sections of ⅛-inch gage plate, stamped to form and lapwelded at the corners. It is strengthened at the rim by a 1 x 1 x ⅛-inch angle section welded all the way around.

Each wheel is mounted on two Timken bearings, arranged to withstand the thrust load occasioned by the passage of the truck over rough or uneven surfaces. The pilot wheel is supported on a stub axle, held in a strap frame which is pinned to the body reinforcing strap.

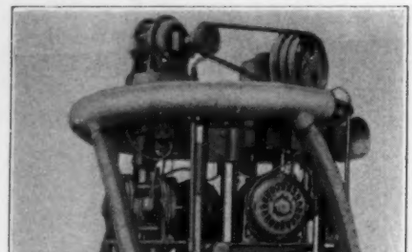
## Large Pitch Gear Teeth Are Generated

No. 86

Farrel-Birmingham Co. Inc., Buffalo, has placed on the market a machine to generate helical, spur and herringbone gears of large pitch. The new unit is capable of producing gears up to 19 inches diameter with 54 inches face width and will cut the well-known Sykes continuous herringbone teeth up to 0.75-inch diameter pitch and straight tooth gears up to 6 inches center pitch. Cutters up to 18 inches pitch diameter are em-

# Iron Trade Review's Calendar of New Equipment

| Item | Comment | Builder | No. | Date Described | Page |
|---|---|---|---|---|---|
| Feed pusher | For high speed handling of stock to screw machines | Eastern Machine Screw Corp. | 65 | March 21 | 793 |
| Welding torch | Simultaneous operation of valves admitting gas and air | St. Paul Welding & Mfg. Co. | 66 | March 21 | 793 |
| Air heater | For recovery of waste heat in stack gases to preheat air | Shaw-Perkins Co. | 67 | March 21 | 794 |
| Grinder | Portable pneumatic type with multivane motor | Ingersoll-Rand Co. | 68 | March 28 | 858 |
| Electrode holder | For metallic arc welding; copper jaws prevent sticking | Lincoln Electric Co. | 69 | March 28 | 859 |
| Die head | Floats on shank, permitting self-centering on stock | Landis Machine Co. | 70 | March 28 | 859 |
| Grinder | Air-operated, light in weight; close speed control | Buckeye Portable Tool Co. | 71 | March 28 | 859 |
| Grinder | Pneumatic; for grinding metals of high tensile strength | Rotor Air Tool Co. | 72 | March 28 | 859 |
| Grinding wheel | Four abrasive segments mounted in 11-inch wheel | Blanchard Machine Co. | 73 | April 4 | 928 |
| Die punching press | Built with six punches and dies, individually operated | Zeh & Hahnemann Co. | 74 | April 4 | 928 |
| Wire reel | For use with cable or wire rope stranding machines | Pittsburgh Producers Supply Co. | 75 | April 4 | 928 |
| Switches | New line of master and limit switches, cam operated | General Electric Co. | 76 | April 4 | 928 |
| Pipe machine | Duplex 12-inch type; designed for oil field work | Bignall & Keeler Machine Works | 77 | April 4 | 929 |
| Gear shaver | For finishing teeth of rough cut gears to true involutes | Pratt & Whitney Co. | 78 | April 11 | 1000 |
| Double-pawl clutch | Incorporated in design of new line of presses | American Can Co. | 79 | April 11 | 1000 |
| Air drill | Rotor governor controls speed and air consumption | Rotor Air Tool Co. | 80 | April 11 | 1001 |
| Polishing machine | Also buffing; double spindles entirely independent | Excelsior Tool & Machine Co. | 81 | April 11 | 1001 |
| Buckets | Open and closed types for materials handling | Reichmann-Becker Polyp Co. | 82 | April 11 | 1001 |
| Coal loader | Electric operation; continuous loading action | Covington Machine Co. | 83 | April 11 | 1001 |
| Pump | Hydraulic; working pressures up to 6500 pounds | John Robertson Co. | 84 | April 11 | 1001 |
| Truck | For carting loose materials about shop | Pittsburgh Producers Supply Co. | 85 | April 18 | 1067 |
| Gear generator | Generates large pitch helical, spur and herringbone gears | Farrel-Birmingham Co. Inc. | 86 | April 18 | 1067 |
| Polishing machine | Grinds, polishes and buffs; four grinding wheels | Excelsior Tool & Machine Co. | 87 | April 18 | 1068 |
| Punches and retainers | Complete line and interchangeable; high safety factor | King Works | 88 | April 18 | 1068 |
| Strip heater | Electric; 24 inches long; for 110 or 220 volts supply | General Electric Co. | 89 | April 18 | 1068 |
| Pouring device | Trolley runs on I-beam; ladle operated electrically | Modern Pouring Device Co. | 90 | April 18 | 1068 |
| Lever punch | Capacity of 5/16-inch hole in 5/16-inch iron | Excelsior Tool & Machine Co. | 91 | April 18 | 1069 |



*No. 87—Polishing and buffing unit*

ployed. Accurately cut gears of large pitch in both herringbone and spur are in large demand in certain branches of industry. This new machine, it is claimed, will meet the most exacting requirements.

## Four Wheels on Buffing and Polishing Units

No. 87

Excelsior Tool & Machine Co., Thirty-first and Ridge street, East St. Louis, Ill., has announced an automatic 4-wheel grinding, polishing and buffing machine with continuous rotary feed. The wheel spindle, guard, wheel truing attachment and belt tightening device of each unit is self-contained and can be adjusted so that the grinding wheels can be set at any angle. Speed of the wheels can be changed without interfering with the production.

Each unit is balanced by adjustable weights so that any desired pressure can be applied to each grinding wheel. At the same time, however, the wheels are free to raise if the material to be ground is of uneven thickness. Incorporated in the design of the machine are four large upright shafts firmly secured to the upper and lower housings on which each unit slides. Long adjustable bearings are provided with supports for the guide bars clamped to the main support shafts. The feed table is driven by internal gear and pinion connected to the worm reducer which is belted to the motor with 3-step cone pulleys for variable table speed.

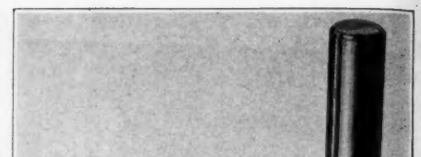
## Interchangeable Punches and Retainers Built

No. 88

King Works, Detroit, announces a complete line of interchangeable punches and punch retainers designed to be fitted into any piercing die, whether single or in gangs. In the case of a broken punch, it can be taken out and renewed without removing the die from the press.

A high factor of safety is embodied in the retaining member against stripping strains and regardless of the load or thickness of the metal it is easily and readily removed because it cannot upset or freeze. Punches and punch retainers are made in all sizes, the punches in a variety of shapes and the retainers in three distinct shapes, appropriate for every method of grouping holes.

Releasing the punch is simple due to the action of the prop when pressed against by an extractor. To line up the punch with the die holes is accomplished easily because of the flexibility of the punch which can be moved up or down before it is locked into position by the action of the prop.



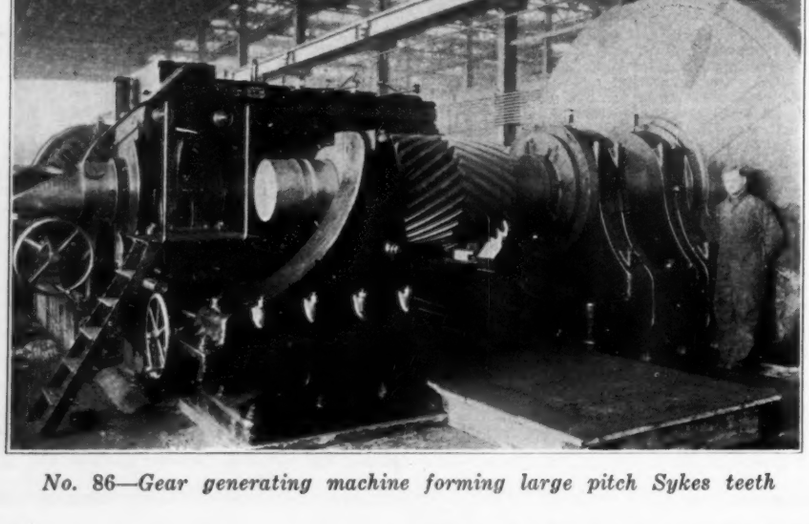
*No. 88—Punch and retainer*

## Announces New Electric Strip Heaters

No. 89

General Electric Co., Schenectady, N. Y. has announced a new electric heater 24 inches long, 1½ inches wide and ⅜-inch thick with a rated capacity of 500 watts at 110 or 220 volts. Slots are provided at each end allowing the heater to be supported in air or clamped to a metal surface.

Both terminals are on one end of the unit and project from the same side. They are nickel-plated brass studs insulated from the sheath by mica washers and fitted with screws for binding the connecting lead wires. Current-carrying resistance wire inside the sheath is the usual nickel-chromium resistor wound in a helix. The coil is supported at the ends by porcelain insulators and is stretched down the length of the unit four times, providing even distribution of heat over the entire surface of the unit.



*No. 86—Gear generating machine forming large pitch Sykes teeth*

## Pouring Ladles Handled by Improved Device

No. 90

Modern Pouring Device Co., Port Washington, Wis., has placed on the market a machine for pouring molten metal. Ladles are raised by switch control push buttons, located at the end of the steadying lever. The machine can be steadied and raised at the same time without interrupting the flow of the metal. This enables pouring of

ladles up to 1000 pounds by one man.

To eliminate all sway in the ladle full of metal, the entire framework of the machine is rigid from the trolley to the ladle trunnions. The structure rotates freely on a ball-bearing thrust collar in the frame of the trolley. All movable parts operate on Timken tapered roller bearings in a continuous bath of oil. The swivel arrangement is continuous, a feature essential in pouring molds on closely crowded conveyors.

The entire machine is built of steel. It is furnished with a ball-bearing trolley adaptable to any size of I-beam.

The device operates at a speed of 8 feet per minute which enables the operator to raise or lower the ladle accurately a minute fraction of an inch while pouring. Worm geared ladle is standard attachment for ladles 500 pounds capacity and over. Other shank constructions can be used when suitable.

## Lever Punch Is Equipped with Ball Bearings

No. 91

Excelsior Tool & Machine Co., Thirty-first and Ridge street, East St. Louis, Ill., has placed on the market a ball bearing lever punch with a capacity of $\frac{7}{16}$-inch hole in $\frac{7}{16}$-inch iron or ½-inch hole in ¼-inch brass or copper. A feature is the ball bearings on the eccentric and main shaft. Forward protruding legs on the stand prevent the machine from being tipped when punching at the capacity of the machine. Two wheels are attached to the back of the stand thereby permitting it to be pushed to any location.

A balance lever keeps the handle in an upright position. Gages both front and side adjustable to requirements and a stripper which does not obstruct the view of the punch, are two other advantages incorporated in its design. The slide is square with provision to take up the wear so that the most delicate odd shape punches and dies can be used without injury. Tool steel bushing in the slide is furnished for $\frac{7}{16}$-inch punch shank and by removing this bushing a ⅞-inch punch shank can be used. The die holder is adjusted easily to suit the punch. All punches have center points unless otherwise specified for this machine. Height over all is 51 inches, the depth of throat, 6 inches and distance from floor to die surface, 36 inches.

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Milwaukee assembly plant of the Ford Motor Co., Detroit, has expanded its force 25 per cent.

*No. 90—Electric pouring device*

## Condensed Foundry Show Is Representative

(*Concluded from Page* 1064)

foundry sand riddles, one large and one small size, and a laboratory riddle for determining the fineness of foundry sand. The Lowe Mfg. Co., Detroit, operated an electrically driven sand sifting machine.

Vent waxes and cores showing their uses were shown in exhibits of the American Vent Wax Co., Lockport, N. Y., and the United Compound Co., Buffalo. Pattern wax also was shown. Graphite, plumbago, core washes and other graphite products were displayed by the United States Graphite Co., Saginaw, Mich.

Nearly a dozen companies exhibited an interesting variety of core binders, including linseed oil, linseed oil base, dry binders and compounds. These exhibits included specimen cores, plain, intricate and heavy type, and a number of finished castings in which cores made from these products were used. Among those exhibitors were Spencer Kellogg & Sons Sales Corp., Buffalo; Werner G. Smith Co., Cleveland; Linsey-McMillan Co., Milwaukee; Knefler-Bates Co., Indianapolis; Corn Products Refining Co., New York; Advance Milling Co., Chicago; Smith Oil & Refining Co., Rockford, Ill.; and Pennsylvania Lubricating Co., Pittsburgh.

Various types of sand for ferrous and nonferrous molding and core use, for rebonding molding sands, and also sand blast sands, fire clay, and silica wash were shown by a number of companies including Illinois Clay Products Co., Joliet, Ill.; Mt. Jewett Fire Clay Co., Mt. Jewett, Pa.; Albany Sand & Supply Co., Albany, N. Y.; Standard Silica Co., Chicago; Eastern Clay Products Co., Buffalo; Ayers Mineral Co., Albany, N. Y., and Industrial Minerals Co., Columbus, O., the latter company also showing steel abrasives.

**Foundry Supplies on Display**

Foundry supply exhibits were well diversified. Moltrup Steel Products Co., Beaver Falls, Pa., showed new bottom boards and squeezer plates with its exhibit of pattern plates, solid and perforated polished core plates. S. Obermayer Co., Chicago, exhibited snap flasks, jackets and other foundry supplies. Malleable Iron Fittings Co., Branford, Conn., had on display a new model flask rapper in its exhibit of foundry vibrators. Diamond Clamp & Flask Co., Richmond, Ind., demonstrated a number of snap flask fittings and also showed wood snap flasks, steel jackets, steel bands, steel bottom plates, steel core plates, wood wedges and wood core boxes. Supplies also were shown by the Sterling Wheelbarrow Co., Milwaukee; Truscon Steel Co., Youngstown, O.; and H. L. Baumgardner Corp., Chicago. Safety equipment comprised an interesting feature of the exhibit. Rohrbacher Shoe Co., Boston, and Safety First Shoe Co., Framingham, Mass., had complete lines of safety shoes, and Safety Clothing Co., Cleveland, exhibited safety clothing made from asbestos, leather and fireproof duck, as well as safety guards for various types of machines, respirators and sandblast helmets.

The design and layout of the modern foundry plant was given attention at the exhibition with displays by the Austin Co., Cleveland, and Frank D. Chase, Inc., Chicago.

Globe Steel Abrasive Co., Mansfield, O., showed samples of cornered steel grit and chilled shot with castings specimens thus cleaned.

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## Seek Shorter Annealing Cycle for Malleable

(*Continued from* 1061)

Ovens" was presented by W. F. Graham, Ohio Brass Co., Mansfield, O., who described the injection of products of combustion from the annealing furnace back into the burner system to aid in maintaining a uniform temperature during the holding period. Fuel used was powdered coal. H. A.

Schwartz, presented a paper on shrinkage in malleable iron castings, in which he gave some data on the method employed for determining the type of shrink and some results obtained from commercial heats.

D. P. Spencer, Racine Steel Castings Co., Racine, Wis.; J. T. MacKenzie, American Cast Iron Pipe Co., Birmingham, Ala.; H. W. Gillett, bureau of standards Washington; R. E. Bryant, Jefferson Union Co., Lexington, Mass.; C. M. Seager, bureau of standards, Washington; W. R. Bean, and others discussed the papers.

J. B. Deisher, A. F. A. representative in the malleable iron division of the advisory committee of the bureau of standards, presented a report of a meeting of the committee in which various phases of the malleable iron industry were considered.

# Foundrymen Devote Increasing Attention To Sand Control

EXTENT to which the many angles of the molding sand question appeal to foundrymen was indicated by large attendance at the sand control sessions. R. A. Bull, director, Electric Steel Founders Research group, Chicago, and one of the men directly responsible for the active participation of the American Foundrymen's association in the movement to investigate foundry sands, occupied the chair at both session.

The afternoon session included the presentation of papers by W. F. Graham, Ohio Brass Co., Mansfield, O.; W. Ranis, Union Malleable Iron Co., Moline, Ill.; R. F. Harrington, Hunt-Spiller Corp., Boston, and E. W. Smith, Crane Co., Chicago.

Mr. Graham explained that at the plant of the Ohio Brass Co., Mansfield, O., the sand is handled in a manner that has become fairly well standardized in recent years. The molds are made and poured continuously on 15 floors and the sand is distributed to the various molding stations by a conveyor belt. The castings are light and therefore the sand is not burned or even dried to a great extent. The necessary amount of water is added at a certain point on the belt by a man who judges the moisture content by squeezing a quantity of the sand in his hand. The bond is renewed and the volume of the sand is maintained by the addition of six barrow loads of sand daily. This works out at the ratio of 425 pounds of new sand per ton of castings produced.

### Laboratory Tests Aid Molders

W. Ranis claimed that the most satisfactory results had been obtained by close co-operation between the laboratory and the foremen in the shop. The laboratory by a careful series of tests and observation determined the ideal sand and then if necessary modified one or more points in conformity with the foremen's recommendations to meet practical operating conditions. The sand is not handled mechanically but is arranged in the familiar long heaps on the floor where each molder cuts it over twice a day. The permeability is held between 8 and 18, the moisture content between 6 and 8 and the compression test between 2 and 3 3/10 pounds. Answering a question from the floor the speaker stated that no sand is accepted unless the lime content is below 5 per cent.

R. F. Harrington presented a report of the conservation and reclamation committee. Several companies reported gratifying results from the use of clay as a bond for old sand.

E. W. Smith, Crane Co., claimed that the scrap pile is the greatest educating medium in the foundry and the study and preparation of sand should be based on this term.

Report of the committee on molding sand research was presented by H. Ries, Cornell university, Ithaca, N. Y., at the evening session. Other papers included Sound Castings, by R. W. Kurtz, Jas. B. Clow & Sons, Newcomerstown, O.; Some Experiments in Sand Control by E. E. Wilson, Jefferson-Union Co., Lockport, N. Y., and The Refractoriness of Foundry Sands, by J. F. McMahon, mines branch, department of mines, Ottawa, Canada.

# Describes Method of Melting Nonferrous Metal in Cupola

NONFERROUS foundry problems were discussed at three sessions. Tuesday noon 130 nonferrous foundrymen met at lunch to discuss the problems of cost peculiar to their branch of the industry. E. B. Hazen, Brass Foundry Co., Peoria, Ill., presided. John Deiterich, Black Hawk Foundry Co., Davenport, Iowa, outlined the experience of gray iron foundrymen in his district in assembling a group to interchange information on costs. These costs are tabulated by an impartial accountant and then used as a basis for individual comparison by the members of the group. Sentiment favored a similar plan for nonferrous foundries.

G. H. Clamer, Ajax Metal Co., Philadelphia, presided at a meeting of 100 nonferrous foundrymen held Wednesday morning. H. J. Roast, National Bronze Co. Ltd., Montreal, Que., discussed practical problems in the brass foundry, including that of segregation of phosphorus which results from too high temperature.

J. B. Meier, F. & H. Foundry Co., Newark, N. J., presented a paper on electric arc furnaces in which he gave data on operation, costs and other items. E. F. Hess, Ohio Injector Co., Mansfield, O.; H. M. St. John, Detroit Lubricator Co., Detroit; and others discussed the paper and referred to advantages of the electric furnace and a comparison of costs between this type of furnace and natural draft coke melting unit.

### Phosphorus Is Discussed

Among the subjects considered at the roundtable discussion on Wednesday were the addition of phosphorus, effect of phosphorus on the color of castings, results of using one sand for molding aluminum, brass and bronze, and the use of rubber core binders. Most speakers agreed that phosphorus gives the best results when added in the furnace, but in the case of low zinc alloys, ladle additions give good results. According to some, phosphorus spoils the color of bronze castings, while others voice an opposite opinion. The same sand should not be used for making aluminum, brass and bronze castings if pressure work is made with the latter two. Aluminum picked up by the sand will be absorbed by the brass and bronze causing leaky castings.

Attention was called to a new type of nonferrous melting unit which employs a cupola with petroleum coke as fuel. It was stated that in one plant a cupola of this type has to be lined every two weeks, but that a new lining of silicon carbide is to be tried as a remedy. It also was claimed that a 500-pound charge of metal can be melted in this unit in about 12 minutes at a melting cost of only $2.60 a ton.

# *Editorials*

## Serves Foundrymen Well

IN MANY respects the thirty-third annual meeting of the American Foundrymen's association held last week in Chicago met the requirements for an ideal convention. The technical program was especially good. The exhibition, while restricted in size, was representative, and the convenience of having all events in one hotel contributed to the success of the affair.

Perhaps the best test of the value of a convention lies in the degree to which the benefits are distributed among those who attend. In this respect the Chicago meeting surpassed all previous ones because it appeared that a greater number of foundrymen participated in the discussions than in previous years. Doubtless this increased interest is largely due to the improved arrangement of the program which this year provided shop courses, round table meetings, and other devices which encouraged foundrymen to discuss their problems informally.

Advancement of the foundry industry depends not only on the vision of its leaders, but also on the intelligent co-operation of foundrymen all along the line. The American Foundrymen's association contributed something tangible to this advance in connection with its recent convention when it presented a wealth of important information and made it available to the great mass of foundrymen. In fact "service to the many" probably is the keynote of present activities of the association.

## The Foundryman Was Right

WHEN chemical analysis superseded grading by fracture a long step in advance was made in pig iron and castings industry. Yet the foundrymen insisted from that time to the present that chemical analysis did not tell the entire story. He found in his experience in making castings that two brands of pig iron of practically identical analysis, as the laboratory reported it, would give differing results. One would make good castings and the other would fall short. The reactionary who stood for the things that were and resisted innovation was not the only user of pig iron who felt that a hidden chapter contained information of great value; information that would tell why results varied from irons of the same chemical makeup.

Research by General Motors Corp., as presented in IRON TRADE REVIEW last week, has lifted the curtain, at least in part, and revealed that the foundryman was right. Practice followed in the manufacture of pig iron now appears to be a factor of importance. It has some influence on the structure of the iron which is not revealed in the laboratory. At the present stage of the investigation the quality and quantity of coke and the volume of water in the blast seem to be the most important factors in producing variation in quality of the iron as the foundryman judges it.

Now that an opening has been made in the obscurity it may be expected further test and research may clear the subject more fully and iron may be produced which will be uniform, following the practice found best by trial. Better control of coke and moisture and possibly other factors undoubtedly would do much to promote greater uniformity in the product.

## East Regaining Lost Ground

THE eastern machine tool market, which in recent years has suffered materially in comparison with equipment markets of the Middle West, is coming more into its own. At one time the center of industrial activity, the East has seen this point of concentration work steadily westward. Mainly under the influence of the centralization of the automobile industry in the Middle West, with its giant growth, its revolutionary methods of mass production and accompanying heavy demands for machine tools, the eastern equipment market lost considerable ground.

However, the actual high point of industrial diversification has remained in the East. Further, the East has continued to dominate such important metal working groups as the electrical, brass, printing machinery, textile equipment, locomotive, shipbuilding and other industries. It is notable that the shipbuilding industry now is becoming decidedly more active.

The East has shared substantially in such relatively new developments as the radio and the airplane, and has experienced a certain backwash from the automobile industry, chiefly through channels of parts and accessory manufacture. It now also is witnessing a modest spurt in the concentration of manufacturing and assembly

plants along the seaboard in anticipation of expansion of exports.

It is the general situation, brought into sharp relief by the intensity of present industrial and commercial prosperity, that has provided eastern sellers of machine tools a degree of activity not experienced in years. Precisely how the volume of machinery business in recent months compares with that of other leading industrial districts is difficult to say. Nevertheless, little doubt exists that the gap between the East and Middle West has been narrowed appreciably.

## Drift From Farms Aids Industry

WHAT improved machinery is accomplishing on the nation's farms is demonstrated in the figures on farm population issued by the bureau of agricultural economics, showing further decrease of farm population in 1928. The fact that the country's food supply is being furnished by 4,500,000 fewer people than 20 years ago to a much larger general population is significant of what has been done in the use of machinery to supplant manual labor in farming communities.

In 1928 nearly 2,000,000 people left the farms for the city, while 1,362,000 went from cities to farms. The movement cityward tends to create a better labor market in industrial centers, particularly skilled and semiskilled. Many from the farms have been attracted to industrial centers by the high wages paid, and have trained themselves for special work, either in universities or by apprentice service of some kind. Some views are that this situation also may add to unemployment problems in the larger centers.

The balance in city and country population is not alarming, considering the improved efficiency of farm production made possible through modern labor-saving machinery.

## Steel Aids Aircraft Housing

STEEL appears admittedly the best material from which to erect hangars at airports and an important tonnage is likely to be needed as air transport increases. Much thought is being given hangar construction and probably no previous fast-developing utility has had the advantage of such careful study. The American Institute of Steel Construction has made a survey of the subject and has reached a number of conclusions of value.

Air transportation is developing at a rapid rate, rendering existing facilities inadequate in a short time. Knowledge of its future development and requirements is lacking. But experience of all types of commercial buildings makes it evident that the steel frame truss, of known strength, unlimited durability, maximum adaptability, flexibility and mobility is eminently fitted for use exclusively in hangar construction.

The problem of obsolescence is relatively more important than in other transportation industries since aviation has not yet grown up and is in a stage of rapid development. Ships are being built in larger models, rendering existing hangars inadequate, and the number of ships requiring hangar space at an airport is increasing rapidly.

To meet this increase, which promises to exceed the probable facilities provided at any airport, steel offers unusual opportunity for rapid reproduction of housing units, enlargement of existing hangars and a minimum of difficulty in disassembling and removal to another location.

Service by the organized steel industry is of the greatest value to those charged with the responsibility of providing housing at airports and costly mistakes by inexperienced authorities may be avoided by taking counsel from sources having knowledge of the situation.

## Jobbers Fear Wrong Impression

EASTERN steel jobbers are facing a condition which to them seems to have its perils. The assumed danger lies in direct mill shipments and their ultimate effect on the consumer. Warehousemen have complained in the past that mills in lean times have encroached by selling small tonnages that should have been left for the jobbers. In the present situation, when mill deliveries are delayed and small tonnages are refused by mills, some jobbers in the East have been selling tonnage from their mill reservations, for delivery direct, without being handled in their warehouses.

The complaint of jobbers who discountenance this practice is that the consumer is not charged the full warehouse differential over mill prices, but an arbitrary of about $5 per ton over the mill price. Inasmuch as there is no handling charge for the jobber, he probably can afford to make this differential.

But the effect on the consumer is feared. Having tasted the low price on his direct mill shipment, compared with the full warehouse differential, it is thought he may consider the latter unduly high when he comes to buy on the regular basis. As a result of this, the jobbers hold, the consumer is likely to think himself into a belief that the differential charged for warehouse service is too large and that he is being penalized unduly for his small purchases.

Some jobbers have come to the conclusion they should refrain entirely from direct mill shipments and avoid any cause for consumers gaining an idea of this sort.

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*E. L. SHANER, Editor.* — *J. D. PEASE, Advertising Director.* — *F. F. LIGHT, Circulation Manager.*

Foundry Exhibition Attracts Thousands, Though Space Is Restricted. Page 1062.

THIS issue features the thirty-third annual meeting of the American Foundrymen's association, and the exhibition of foundry equipment and supplies, held at the same time in the Stevens hotel, Chicago, last week. More than nine pages, beginning with page 1057, are devoted to reports of the sessions and description of the exhibits. The technical program was of the usual high standard, with several papers of more than ordinary importance. All of the meetings and exhibits were in the hotel, and while space necessarily was restricted about 150 manufacturers participated in the exhibition.

# *The Readers' Page*

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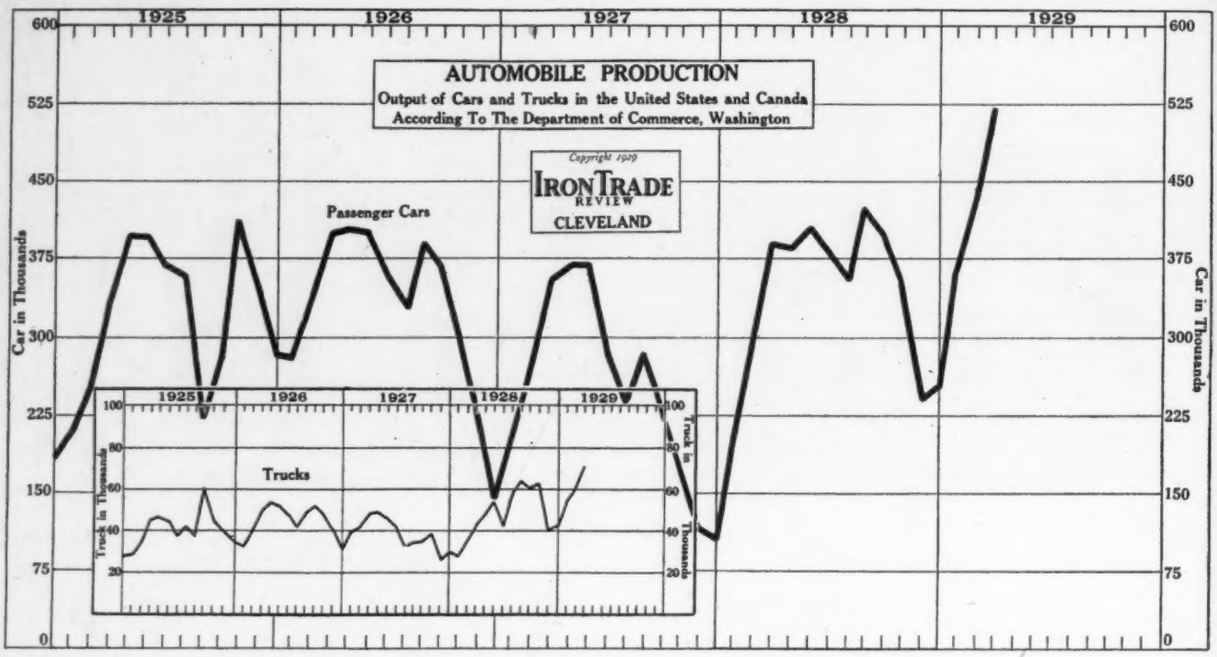
# The Business Trend




## Motor Car Output Near Crest

By JOHN W. HILL, Financial Editor

RELIABLE estimates of the production of automobiles during March indicate a total of about 595,000 cars and trucks in the United States and Canada, including Ford European output. This compares with 497,000 cars and trucks produced in the United States and Canada in February and with 430,800 for March 1928. February production was the peak up to that time and March went ahead even of that month.

FOR the full first quarter the production of cars and trucks was more than 1,500,000, compared with the previous record of 1,162,808 in the first quarter of 1926. Apparently the automobile industry is setting out to do the impossible. Some authorities at the beginning of the year forecast an output of 3,000,000 cars and trucks in the first half. That is the rate actually maintained in the first quarter.

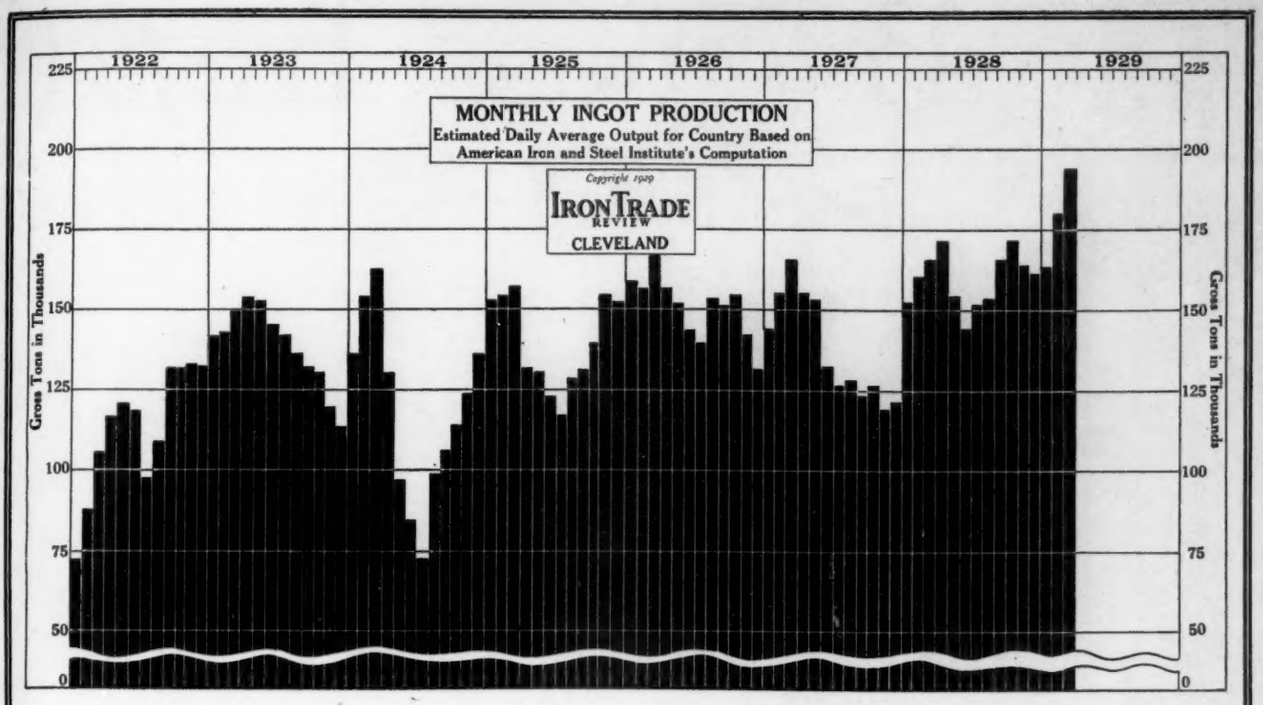
DURING March the annual rate of output was about 7,000,000 cars and trucks. No calm observer believes that this pace can be held. The biggest year on record was 1928 with an output 4,600,000 cars and trucks. It seems probable that there may be a domestic and export market for 5,000,000 units during 1929.

IF THAT is the limit of the market, sharp curtailment of present rates of output is likely later in the year. So far, however, production schedules for large producers continue high. Some slowing down and spottiness are reported here and there but the industry as a whole is extraordinarily busy. One of the most remarkable developments is the report from responsible authorities that stocks are not excessive.

IN VIEW of the record-breaking output it was generally thought that floors of dealers were being choked with cars. Such, it appears, is not the case. It is true that much of the large production has been to provide for the peak of spring demand, and stocks are said to be some 250,000 units above one year ago. But relative to current demand, supplies are not excessive.

ABOUT 50 per cent of current production is from the two large producers of low priced cars, Ford again being the leading producer. Exclusive of Ford it is estimated that the gain in output in the first quarter was only 9 per cent. For the industry as a whole, it seems probable that the crest is near at hand and that any further changes may be to lower levels.

# The Business Trend

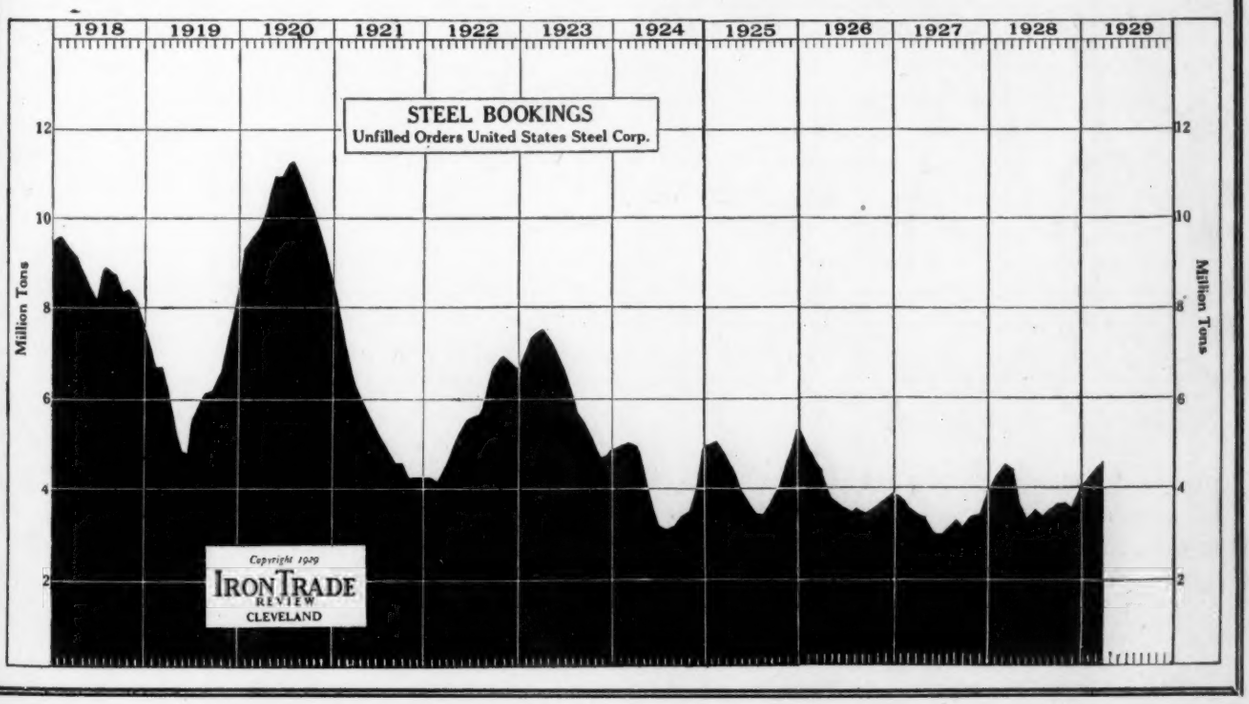



## Steel Ingot Output

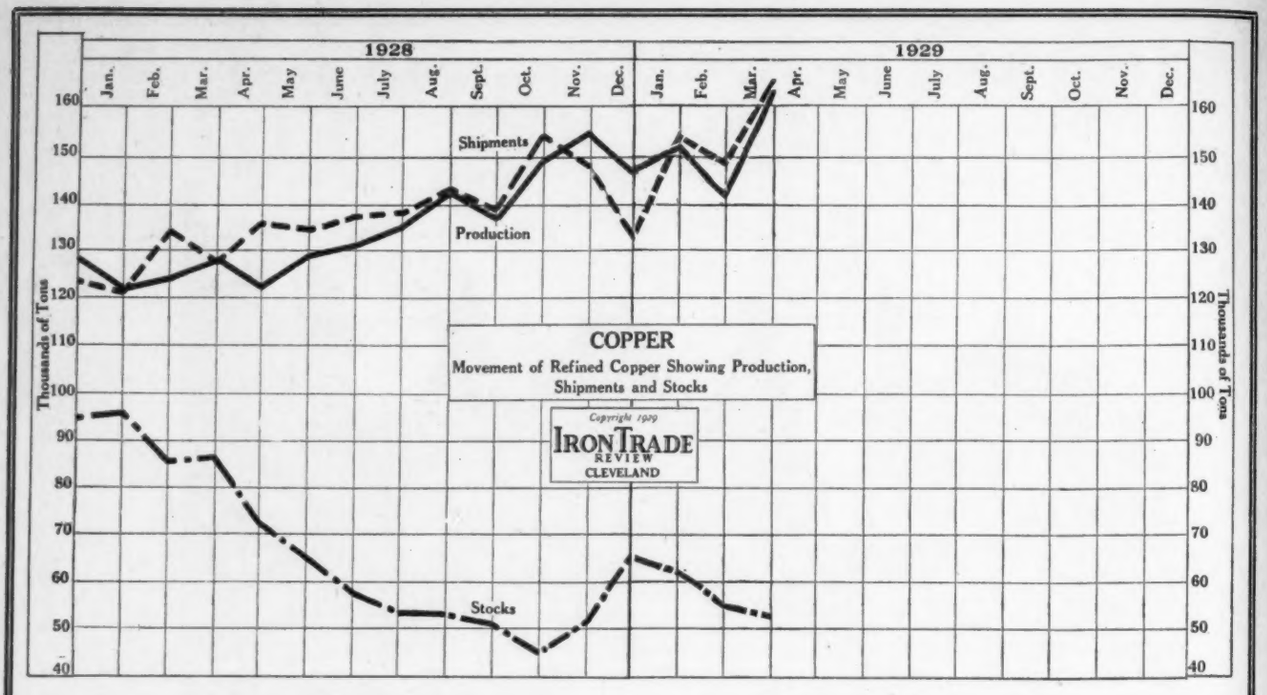
FOR the first time on record, the steel industry operated at more than 100 per cent of its ingot making capacity during March. Unprecedented daily average production for the month of 194,199 tons represented operations at 103 per cent of computed capacity. This compared with 179,926 tons in February and with 166,945 tons in March, 1928. The month's output was at the annual rate of more than 60,000,000 tons. Production for the first quarter was 13,849,701 tons.

## Steel Bookings

NOTWITHSTANDING the record-breaking output of iron and steel during March, unfilled orders of the United States Steel Corp. increased 266,377 tons over the month. Total orders at the end of March amounted to 4,410,718 tons, compared with 4,335,206 tons one year before. It is noteworthy that in March, 1928, unfilled orders declined 63,000 tons and in February of this year the gain was only 34,000 tons. Since the beginning of April new business has declined in volume seasonally.



# The Business Trend

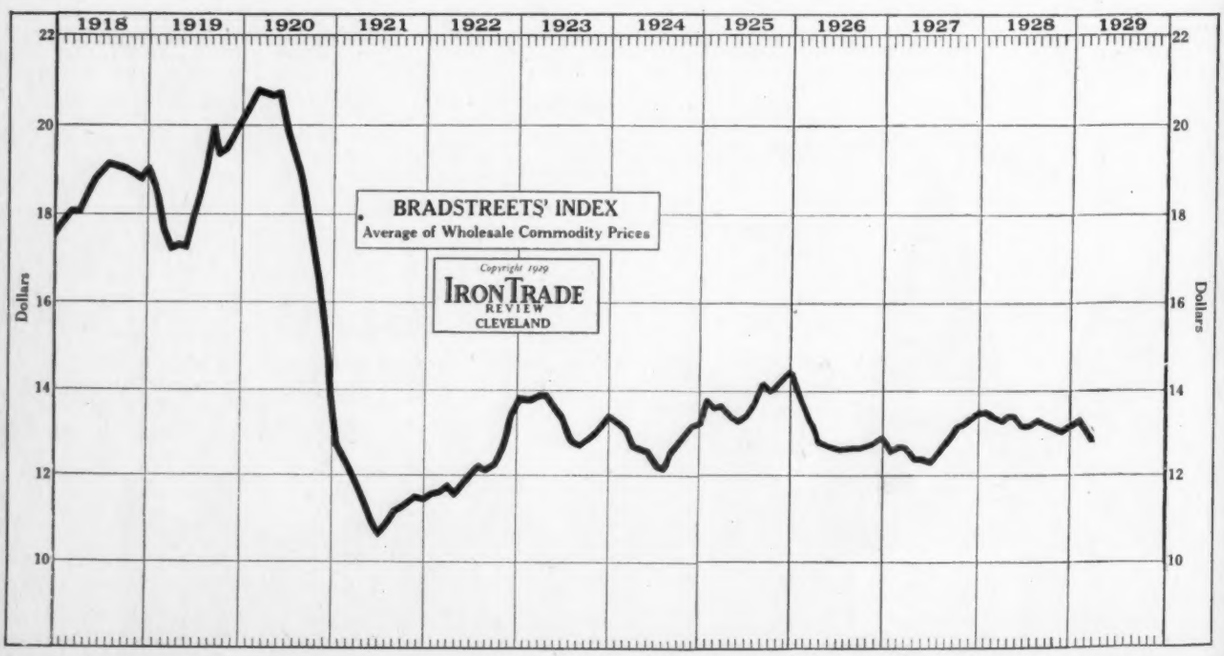



## Refined Copper

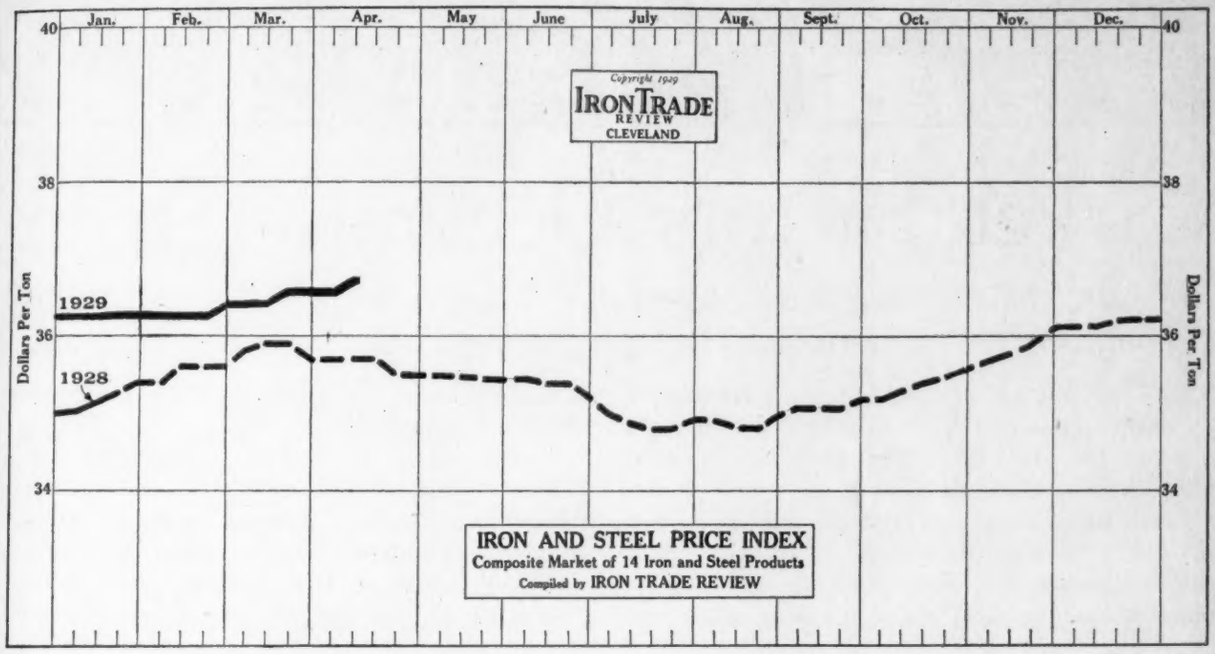
UNPRECEDENTED production and shipments of copper and a small decline in stocks during March preceded the drastic break in the prices of the metal in April. With needs of consumers well covered for some time ahead, current demand for copper subsided at a time when production had mounted to great heights. March output of copper was 163,561 tons, compared with 128,972 tons in March, 1928. Shipments were 165,806 tons, compared with 128,612 tons one year before.

## Bradstreet's Index

THE general level of wholesale prices declined during March and at the beginning of April Bradstreet's commodity price index was at the lowest point since August, 1927. The index at the beginning of April showed a decline of 1 per cent from the preceding month and 4.1 per cent from the index of one year before. Of the 13 groups of commodities comprising the index, only two increased during March, these being livestock and copper. Since March, however, copper has shown a decline.



# The Business Trend

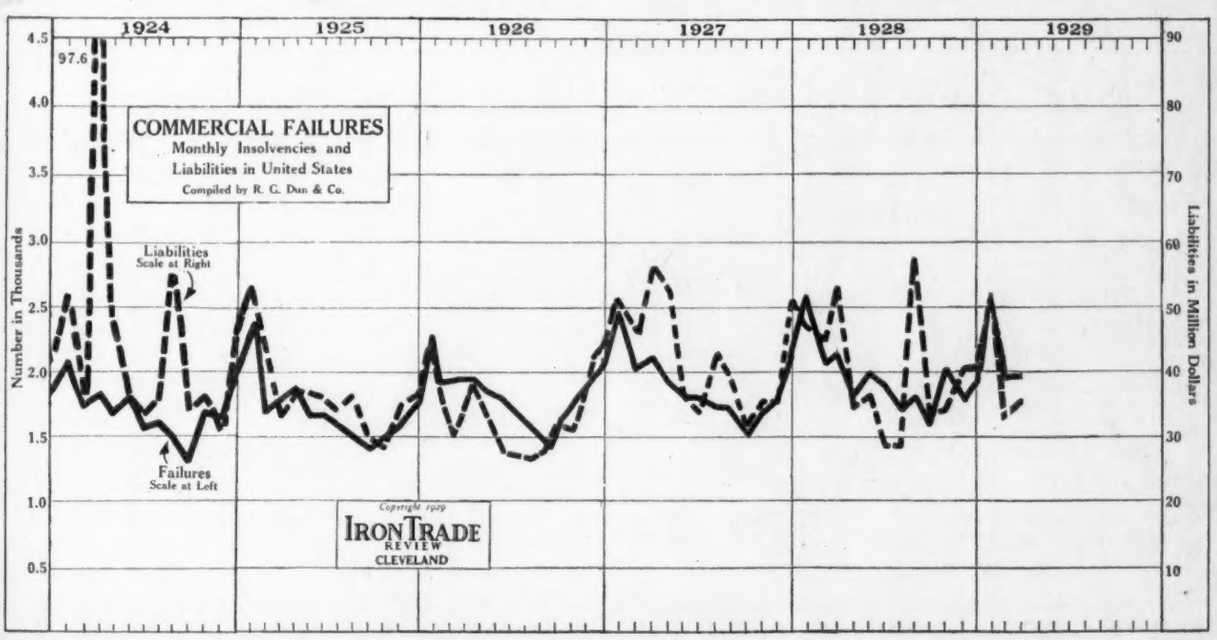



## Steel Price Index

ONE of the most constructive developments in the iron and steel industry since the first of the year has been the continued firmness of prices in the face of extraordinary volumes of output. It is also a favorable fact that although prices have been displaying strength since the summer of 1928, there has been no hint of inflation or over-rapid advances. IRON TRADE REVIEW'S composite market average increased 24 cents a ton during the second week of April to $36.81 a ton, the highest in two years.

## Business Failures

NOT since 1926 has the record of business failures in the United States been as favorable as during the first quarter of the current year. For the period there were 6487 failures involving liabilities of $124,268,608, compared with failures during the first quarter of 1928 of 7055 and liabilities of $147,519,198. There was a decrease of 9 per cent in the number and of 16 per cent in the indebtedness. March failures of 1987 compared with 2236 in March, 1928. Liabilities for the month were $36,355,691.



# Market Factors Generally Strong

## *Pressure for Finished Steel Maintained Though, as in Pig Iron, Buying Diminishes—Semifinished Shortage Hurts—Valley Iron Up 50 Cents*

FINISHED steel markets display remarkable vitality considering their record performance thus far in 1929. The situation is more mixed, a condition likely to become accentuated as the quarter wears on, but on the whole production is off only fractionally from the recent peak, deliveries on some products are further deferred, and specifications assure May operations.

### Third Quarter Buying Naturally Slow

Most consumers being well protected for the second quarter and loath, as usual, to commit themselves for the third, incoming business in some lines has contracted. In isolated cases dragging delivery of some products has compelled users to hold back on others more readily available.

Neutralizing this, mills only now are receiving specifications against some of the recent heavy railroad equipment orders, resulting in the paradox of deliveries lengthening as new business shrinks. Steelmaking equipment may shortly begin to feel the strain of operations in excess of 100 per cent for six to eight weeks, and this may militate against an easier situation despite some ebbing in demand.

Though Steel corporation subsidiaries are off 2 points from their 98 per cent schedule of last week, their position appears relatively stronger than that of independent producers. The increase of 266,377 tons in their unfilled tonnage as of March 31 in the face of record production evidences this. Independent producers this week average 96 per cent. Chicago operations hold at about 98 per cent, Pittsburgh at 95 and Buffalo at 90, while the Mahoning valley gained slightly this week to 92 per cent.

### Iron Shipments Big; Sales Light

Pig iron presents a less virile situation as regards new buying, but shipments have lost none of their vigor. Some quiet placing of third quarter requirements of large melters is noted, but average consumers probably will not buy for that delivery until May. Automotive foundries in particular are pressing for iron. Several producers are up 50 cents on all grades in the Pittsburgh-Youngstown district, but the new levels

## Comparative Prices of Iron, Steel and Coke

**Representative Market Figures for This Week, Last Month, Three Months and One Year Ago**

| | April 17, 1929 | March 1929 | Jan. 1929 | April 1928 |
|---|---|---|---|---|
| **PIG IRON** | | | | |
| Bessemer, del. Pittsburgh | $20.26 | 20.11 | 19.96 | 19.26 |
| Basic, valley | 18.00 | 17.60 | 17.50 | 16.75 |
| Basic, eastern del., eastern Pa. | 20.50 | 20.25 | 20.15 | 19.25 |
| No. 2 foundry, del. Pittsburgh | 19.76 | 19.51 | 19.36 | 19.01 |
| No. 2 foundry, Chicago | 20.00 | 20.00 | 20.00 | 18.50 |
| *Southern No. 2, Birmingham | 15.50 | 16.00 | 16.50 | 16.00 |
| **No. 2X, Virginia furnace | 20.75 | 21.00 | 21.25 | 20.50 |
| **No. 2X, eastern del. Phila. | 22.26 | 22.26 | 22.26 | 21.26 |
| Malleable, valley | 18.50 | 18.10 | 18.00 | 17.25 |
| Malleable, Chicago | 20.00 | 20.00 | 20.00 | 18.50 |
| Lake Superior charcoal, del. Chicago | 27.04 | 27.04 | 27.04 | 27.04 |
| Gray forge, val., del. Pittsburgh | 19.26 | 19.11 | 18.76 | 18.56 |
| Ferromanganese, del. Pittsburgh | 109.79 | 109.79 | 109.79 | 104.79 |
| *1.75 to 2.25 silicon. **2.25 to 2.75 silicon. | | | | |
| **COKE** | | | | |
| Connellsville, furnace, ovens | 2.75 | 2.95 | 2.75 | 2.60 |
| Connellsville, foundry, ovens | 3.75 | 3.75 | 3.75 | 3.65 |
| **SEMIFINISHED MATERIAL** | | | | |
| Sheet bars, open-hearth, Youngstown | 35.00 | 35.00 | 34.00 | 32.75 |
| Sheet bars, open-hearth, Pittsburgh | 35.00 | 35.00 | 34.00 | 34.00 |
| Billets, open-hearth, Pittsburgh | 34.00 | 34.00 | 33.00 | 33.00 |
| Wire rods, Pittsburgh | 42.00 | 42.00 | 42.00 | 44.00 |

| | April 17, 1929 | March 1929 | Jan. 1929 | April 1928 |
|---|---|---|---|---|
| **FINISHED MATERIAL** | | | | |
| Steel bars, Pittsburgh | 1.95 | 1.90 | 1.90 | 1.85 |
| Steel bars, Chicago | 2.05 | 2.05 | 2.00 | 2.00 |
| Steel bars, Philadelphia | 2.27 | 2.27 | 2.27 | 2.17 |
| Iron bars, Chicago | 2.05 | 2.00 | 2.00 | 2.00 |
| Shapes, Pittsburgh | 1.95 | 1.90 | 1.90 | 1.85 |
| Shapes, Philadelphia | 2.06 | 2.01 | 2.06 | 2.08 |
| Shapes, Chicago | 2.05 | 2.05 | 2.00 | 2.00 |
| Tank plates, Pittsburgh | 1.95 | 1.90 | 1.90 | 1.85 |
| Tank plates, Philadelphia | 2.15 | 2.10 | 2.10 | 2.10 |
| Tank plates, Chicago | 2.05 | 2.05 | 2.00 | 2.00 |
| Sheets, black, No. 24, Pittsburgh | 2.95 | 2.85 | 2.85 | 2.75 |
| Sheets, blue anl., No. 10, Pittsburgh | 2.20 | 2.10 | 2.10 | 2.05 |
| Sheets, gal., No. 24, Pittsburgh | 3.70 | 3.60 | 3.60 | 3.65 |
| Sheets, black, No. 24, Chicago | 3.10 | 3.10 | 3.00 | 3.05 |
| Sheets, blue anl., No. 10, Chicago | 2.35 | 2.35 | 2.25 | 2.25 |
| Sheets, galvanized, No. 24, Chicago | 3.85 | 3.85 | 3.75 | 3.90 |
| *Plain wire, Pittsburgh | 2.50 | 2.50 | 2.50 | 2.50 |
| *Wire nails, Pittsburgh | 2.65 | 2.65 | 2.65 | 2.60 |
| Tin plate, per base box, Pittsburgh | 5.35 | 5.35 | 5.35 | 5.25 |
| *To large jobbers. | | | | |
| **SCRAP** | | | | |
| Heavy melting steel, Pittsburgh | 18.75 | 18.50 | 19.00 | 14.85 |
| Heavy melting steel, eastern Pa. | 17.00 | 16.25 | 16.50 | 13.75 |
| Heavy melting steel, Chicago | 16.00 | 15.55 | 16.50 | 12.75 |
| No. 1 wrought, eastern Pa. | 16.25 | 16.25 | 15.50 | 15.25 |
| No. 1 wrought, Chicago | 16.75 | 16.00 | 14.75 | 12.45 |
| Rails for rolling, Chicago | 17.50 | 17.50 | 17.10 | 14.00 |

# Current Prices for Rolled Steel Products

PRICES IN CENTS PER POUND

### STEEL PLATES

| | |
|---|---|
| Pittsburgh, base | 1.95c |
| Philadelphia, del. | 2.15c to 2.25c |
| New York, del. | 2.225c to 2.325c |
| Boston, del. | 2.265c to 2.415c |
| Chicago, base | 2.05c to 2.15c |
| **Cleveland, delivered** | 2.14c |
| Lackawanna, N. Y., base | 2.05c to 2.15c |
| Birmingham, base | 2.10c to 2.20c |
| Coatesville, Pa., base | 2.00c to 2.10c |
| Pacific Coast, c.i.f. | 2.35c |
| **St. Louis, del.** | 2.27c |
| Detroit, del. | 2.19c to 2.24c |

### STRUCTURAL SHAPES

| | |
|---|---|
| Pittsburgh, base | 1.95c |
| Philadelphia, base | 2.06c to 2.11c |
| New York, del | 2.195c to 2.245c |
| Boston, del. | 2.265c to 2.415c |
| Chicago, base | 2.05c to 2.15c |
| Cleveland, delivered | 2.14c |
| Lackawanna, N. Y. | 2.05c to 2.15c |
| Birmingham, base | 2.10c to 2.20c |
| Bethlehem, Pa., base | 2.00c to 2.10c |
| Pacific Coast, c.i.f. | 2.35c |
| Detroit, del. | 2.19c to 2.24c |

### BARS

SOFT STEEL

| | |
|---|---|
| Pittsburgh, base | 1.95c |
| Chicago, base | 2.05c to 2.15c |
| Birmingham, base | 2.10c to 2.20c |
| Lackawanna, N. Y., base | 2.05c to 2.15c |
| Pacific Coast, c.i.f. | 2.35c |
| **Cleveland, base, local mills** | 1.95c |
| Cleveland, del., outside mills | 1.95c to 2.00c |
| Philadelphia, del. | 2.27c to 2.37c |
| New York, delivered | 2.29c to 2.39c |
| Boston, delivered | 2.265c to 2.415c |
| Detroit, del. | 2.19c to 2.24c |
| Pittsburgh, cold finishing | 2.05c |
| Pittsburgh, forging quality | 2.15c |

RAIL STEEL

| | |
|---|---|
| Chicago Heights | 1.95c |
| Eastern mills | 1.85c to 1.95c |

IRON

| | |
|---|---|
| Chicago, base | 2.05c to 2.15c |
| New York, delivered | 2.19c to 2.24c |
| Philadelphia, delivered | 2.17c to 2.22c |
| Pittsburgh, refined | 2.75c to 4.25c |

REINFORCING

| | |
|---|---|
| Pittsburgh, billet, cut lengths | 2.25c to 2.30c |
| Stock lengths from mill | 2.00c to 2.05c |
| Chicago, billet | 2.35c to 2.40c |
| Chicago, rail steel | 2.00c to 2.05c |
| Chicago, rail steel, road and bridge work | 1.95c to 2.05c |
| Philadelphia, cut lengths | 2.57c to 2.62c |

### SHEETS

SHEET MILL BLACK

| | |
|---|---|
| No. 24, Pittsburgh, base | 2.85c to 2.95c |
| No. 24, Philadelphia, delivered | 3.27c |
| No. 24, Gary, Indiana Harbor | 3.05c |
| No. 24, Chicago, delivered | 3.10c |
| No. 24, Birmingham, base | 3.10c |
| No. 24, St. Louis, del. | 3.27c |
| **No. 24, Pacif. coast ports, c.i.f.** | 3.50c |

TIN MILL BLACK

| | |
|---|---|
| No. 28, Pittsburgh, base | 3.00c |
| No. 28, Gary, base | 3.10c |

GALVANIZED

| | |
|---|---|
| No. 24, Pittsburgh, base | 3.60c to 3.70c |
| No. 24, Philadelphia, delivered | 4.02c |
| No. 24, Gary, Indiana Harbor | 3.80c |
| No. 24, Chicago, delivered | 3.85c |
| No. 24, Birmingham, base | 3.85c |
| No. 24, St. Louis, del. | 4.02c |
| No. 24, Pacif. coast ports, c.i.f. | 4.25c |

BLUE ANNEALED

| | |
|---|---|
| No. 10, Pittsburgh, base | 2.10c to 2.20c |
| No. 10, Philadelphia, delivered | 2.42c to 2.52c |
| No. 10, Gary, Indiana Harbor | 2.30c |
| No. 10, Chicago, delivered | 2.35c |
| No. 10, Birmingham, base | 2.35c |
| No. 10, St. Louis, del. | 2.52c |
| **No. 10, Pacif. coast ports, c.i.f.** | 2.725c |

AUTOMOBILE

| | |
|---|---|
| No. 20, Pittsburgh, base | 4.10c |
| No. 20, Detroit, delivered | 4.39c |

FURNITURE

| | |
|---|---|
| No. 24, Grade A, Pittsburgh | 4.00c to 4.10c |
| No. 24, Grade B, Pittsburgh | 3.80c to 3.90c |

*(Turn to the following page)*

have not been put to the test. Basic and foundry iron have been advanced 50 cents in eastern Pennsylvania.

Of the raw materials other than pig iron, scrap is variable but with a steady movement and prices generally strong. Relatively, the Pittsburgh market is the strongest. Though more merchant ovens have been blown out, beehive furnace coke market is not strong.

Especially at Pittsburgh have plates wrested market leadership from bars. Line pipe and tank work there and at Chicago account for large tonnages, and in the East a number of pipe lines that will probably go steel are being figured. A Milwaukee maker of welded pipe is taking 75,000 tons of plates this month. A Great Lakes steamer inquiry calls for 2500 tons.

### Carbuilders Are Specifying Shapes

Structural activity, while responding somewhat to the season, continues to feel the restrictions on credit. Reinforcing bar projects are similarly affected. Carbuilders at Chicago are beginning to specify small shapes for recent car orders and on some sections delivery before June is impossible. Activity in soft steel bars is a shade off the peak of late March, but scarcely sufficiently to enable mills to deliver more promptly. Backlogs of Chicago bar mills are longer. Lack of sheet bars continues to dampen sheet production in the Pittsburgh, Youngstown and Chicago districts. Deliveries have not advanced perceptibly, and on full-finished sheets some makers offer no better than five weeks and on the common finishes three to four weeks. Contrasting with the strong situation in heavy steel prices, occasional weakness has developed in the common sheet grades.

### Strip Deliveries Are Shade Easier

Fresh buying of both hot and cold rolled strip is lighter. Specifications continue heavy, but most makers have improved delivery slightly. Manufacturers' wire is moving at substantially the peak rate. Cast pipe lettings are not up to seasonal expectations.

For the 1600 cars ordered in the past week, including 1000 for the Canadian National and 500 for the Northern Pacific, carbuilders have over 30,000 tons of steel to place. New inquiry includes 500 for the Union Pacific.

First cargoes of 1929 Lake Superior iron ore are being brought down this week, there being especial demand for some special grades, stocks of which the unusual consumption of the first quarter cut down. Further buying substantiates the advance of 25 cents a ton in Lake ore.

Outlook for the British iron and steel industry is distinctly favorable, states the IRON TRADE REVIEW weekly cable from London, with Middlesbrough producers planning to light three stacks.

## Composite Market Average

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

| | |
|---|---|
| This week (April 17, 1929) | $36.82 |
| Last week (April 10, 1929) | 36.81 |
| One month ago (March, 1929) | 36.42 |
| Three months ago (January, 1929) | 36.24 |
| One year ago (April, 1928) | 35.67 |
| Ten years ago (April, 1919) | 48.45 |
| Fifteen years ago (April, 1914) | 23.39 |

An advance in basic iron in eastern Pennsylvania has put up the IRON TRADE REVIEW composite of fourteen leading iron and steel products one cent, to $36.82. One month ago this index of industry stood at $36.42.

# Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

Tubular Products Quoted On Last Editorial Page—See Preceding Page For Other Products

## HOOPS, BANDS, STRIPS

| | |
|---|---|
| Hot strip, to 6-in., Pitts. | 2.00c |
| Hot strip 6 1/7 to 24-in., Pitts. | 1.90c |
| Hot rolled strip, 12 to 24-inch 16 gage and heavier, coils or cut length, 1.90c plate basis, or 2.10c blue annealed basis. | |
| Hot strip, bands 6 in. and under, Chicago | 2.10c to 2.30c |
| Do, 6 1/7 to 24 in. | 2.00c to 2.10c |
| Cooperage stock | 2.20c |
| Cold rolled strip, hard coils, 16 inches and under by 0.100-inch and heavier, base Pitts., Cleve. (3 ton and over) | 2.75c to 2.85c |
| Worcester, Mass. (3 tons and over) | 3.10c to 3.20c |

## ALLOY STEEL

Hot Rolled

F.o.b. Mills

Alloy Quality Bar Base is 2.65c

| S.A.E. Series Number | Alloy differential | Net 100 lb. bars |
|---|---|---|
| 2000 | 0.25 | $2.90 |
| 2100 | 0.55 | 3.20 |
| 2300 | 1.50 | 4.15 |
| 2500 | 2.25 | 4.90 |
| 3100 | 0.55 | 3.20 |
| 3200 | 1.35 | 4.00 |
| 3300 | 3.80 | 6.45 |
| 3400 | 3.20 | 5.85 |
| 4100 0.15-0.25 Mo. | 0.50 | 3.15 |
| 4100 0.25-0.40 Mo. | 0.70 | 3.35 |
| 4600 0.20-0.30 Mo. 1.25-1.75 Ni. | 1.05 | 3.70 |
| 5100 0.60-0.90 Cr. | 0.35 | 3.00 |
| 5100 0.80-1.10 Cr. | 0.45 | 3.10 |
| 5100 Chrome Spring | 0.20 | 2.85 |
| 6100 Bars | 1.20 | 3.85 |
| 6100 Spring Steel | 0.95 | 3.60 |
| Chrome Nickel Vanadium | 1.50 | 4.15 |
| Carbon Vanadium | 0.95 | 3.60 |
| 9250 (flats) | 0.25 | 2.90 |
| 9250 (rounds squares) | 0.50 | 3.15 |

## COLD FINISHED STEEL

| | |
|---|---|
| Cold finished steel bars drawn or rolled, Pitts., Chi., e.l. | 2.30c |
| Do, del. Detroit | 2.575c |
| Shafting (turned, polished) Pittsburgh | 2.30c |
| Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch) | 2.65c to 3.10c |
| Cold finished steel bars, Cleve. | 2.25c to 2.35c |

## WIRE PRODUCTS

F.o.b. Pittsburgh, Cleveland, Ironton base

| (Per pound) | Dealer trade | Large jobbers |
|---|---|---|
| Bright plain wire, 6 to 9 gage | 2.60c | 2.50c |
| Annealed field wire | 2.75c | 2.65c |
| Galvanized wire | 3.20c | 3.10c |
| Barbed wire, galvanized | 3.40c | 3.30c |
| (Per 100-pound keg) | | |
| Wire nails | $2.75 | $2.65 |
| Galvanized nails | 4.75 | 4.65 |
| Polished staples | 3.20 | 3.10 |
| Galvanized staples | 3.45 | 3.35 |
| Cement coated nails | 2.75 | 2.65 |
| Manuf. wire, del. Detroit | | 2.735c |
| Wire nails, del. Detroit | | $2.885 |

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Pittsburgh-Cleveland-Ironton base on products made there; Duluth $2 higher; Worcester, Mass., Fairfield, Ala., $3 higher.

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

Anderson, Ind., $1 higher, Chicago $2 higher, Duluth, Birmingham $3 higher.

## CUT NAILS, CHAIN PILING

| | |
|---|---|
| Cut nails, c.l., f.o.b. mills | 2.75c |
| Cut nails, l.c.l. f.o.b. mills | 2.85c |
| Chain, 1-in., proof coil, Pitts. | 6.00c |
| Sheet piling, base, Pittsburgh | 2.25c |

## CAST IRON WATER PIPE

Prices per net ton

Class B pipe

| | |
|---|---|
| Six-inch and over, Birming'm | $37.00 to 38.00 |
| Four-inch, Birmingham | 41.00 to 42.00 |
| Four-inch, Chicago | 49.20 to 50.20 |
| Six-inch to 24-inch, Chicago | 45.20 to 46.20 |
| Four-inch, New York | 41.80 to 43.80 |
| Six-inch and over, New York | 38.80 to 40.80 |
| Standard fittings, Bir. base | $100.00 |

Six to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $10; 3-inch, plus $20 gas pipe fittings, $5 higher.

Class A pipe is $4 higher than Class B.

## TIN AND TERNE PLATE

Prices per 100-pound box Pittsburgh

| | |
|---|---|
| *Tin plate, coke base | $5.35 |

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24.. 4.00c to 4.10c

*Price subject to quantity differentials.

## WASHERS

| | |
|---|---|
| Wrought, c.l., Pitts. dist | $6.50 to 6.75 off |
| Wrought, c.l., Chicago dist | $6.70 to 6.90 off |
| Lock: to dealers | 85-5 off |
| Lock: to consumers | 85 off |

## RAILS, TRACK MATERIAL

| | |
|---|---|
| Standard bessemer rails, mill | $43.00 |
| Standard open-h'th rails, mill | $43.00 |
| Relaying rails, St. Louis | $24.00 to 31.00 |
| Relay rails, Pitts., 60 to 90 lb. | $22.00 to 27.00 |
| Light rails, 25 to 45, mill | $36.00 |
| Angle bars, Chicago base | 2.75c |
| Spikes, railroad, Pittsburgh | 2.80c |
| Spikes, small railroad, 7/16-inch and smaller, Pitts. | 2.80c |
| Spikes, boat and barge, Pitts. | 3.00c |
| Spikes, railroad, Chicago | 2.80c |
| Track bolts, Pitts., steam roads | 3.80c |
| Track bolts, Pitts., stand, jobbers | 70 off list |
| Track bolts, Chicago | 3.80c |
| Tie plates, Chicago, Pitts. | $43.00 |

## BOLTS AND NUTS

Birmingham and Chicago

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927.

Small lots are 55 to 60 per cent off.

### CARRIAGE BOLTS

| | |
|---|---|
| All sizes, cut thread | 60 to 70 off |

Rolled thread 5/8 x 6 and smaller take 10 per cent lower list.

| | |
|---|---|
| Eagle list | 60 to 70 off |

### MACHINE BOLTS

| | |
|---|---|
| All sizes, cut thread | 60 to 70 off |

Rolled thread 5/8 x 6 and smaller take 10 per cent lower list.

| | |
|---|---|
| Lag screws | 60 to 70 off |
| Plow bolts, Nos. 1-2-3-7 heads | 60 to 70 off |
| Tap bolts | 60 to 70 off |
| Blank bolts | 60 to 70 off |
| Stud bolts without nuts | 60 to 70 off |

Stove bolts, 75, 20, 10 and 5 off in pkgs., 75, 20, 10 and 5 with 2½ off in bulk.

| | |
|---|---|
| Tire bolts | 60-5 off |

### Nuts

| | |
|---|---|
| Semifinished | 60 to 70 off |

### HEXAGON CAP SCREWS

| | |
|---|---|
| Milled | 80-10-5 off |
| Upset 1 in. diam. and smaller | 85-off |

### SQUARE HEAD SET SCREWS

| | |
|---|---|
| Milled | 80-5 off |
| Upset 1 in. diam. and smaller | 80-10-5 off |

## RIVETS

| | |
|---|---|
| Struc., c.l., Pitts-Cleve. | 3.10c |
| Structural, c.l. Chicago | 3.20c |
| **7/16-inch and smaller, Pitts. | 70 and 10 off |
| Chi., Cleve | 70 to 70 and 10 off |

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

# Raw Materials and Semifinished Products

## SEMIFINISHED MATERIAL

Prices Per Gross Ton

### BILLETS AND BLOOMS

4 x 4-inch base

| | |
|---|---|
| Pittsburgh, open-hearth | $34.00 |
| Pittsburgh, bessemer | 34.00 |
| Youngstown | 34.00 |
| Cleveland | 34.00 |
| Philadelphia | 39.30 |
| Chicago | 35.00 |
| Forging, Chicago | 40.00 |
| Forging, Pittsburgh | 38.00 to 39.00 |
| Forging, Philadelphia | 44.30 |

### SHEET BARS

| | |
|---|---|
| Pittsburgh | $35.00 |
| Youngstown | 35.00 |
| Cleveland | 35.00 |
| Chicago | 35.00 |

### SLABS

| | |
|---|---|
| Pitts., Young., and Cleve. | $34.00 |

### WIRE RODS

| | |
|---|---|
| Pittsburgh, Cleveland | $42.00 |
| Chicago | 43.00 |

### SKELP

| | |
|---|---|
| All grades, Pittsburgh | 1.90c to 1.95c |

## IRON ORE

### LAKE SUPERIOR ORE

Per Gross Ton, Lower Lake Ports

| | |
|---|---|
| Old range nonbessemer, 51½% | 4.65 |
| Mesabi bessemer, 51½% | 4.65 |
| Old range nonbessemer, 51½% | 4.50 |
| Mesabi nonbessemer, 51½% | 4.50 |
| High phosphorus, 51½% | 4.40 |

### EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

| | |
|---|---|
| Foundry and basic, 56-63% | 8.00 |
| Copper free low phosphorus 58 to 65 per cent | nominal |

### FOREIGN ORE

Cents per unit, alongside docks Atlantic ports

| | |
|---|---|
| Foreign manganiferous ore, 45-55% iron, 6-8% manganese | 10.50 to 11.00 |
| North African low phosphorus | 11.50 to 11.75 |
| Swedish foundry or basic, 65% | 9.00 to 10.00 |
| Spanish and North African basic, 50 to 60 per cent | 10.00 to 11.00 |
| Newfoundland foundry, 55% | 8.50 to 9.00 |
| Tungsten spot and early fut., short ton unit, duty paid | $13.00 to 14.00 |

## MANGANESE ORE

Prices do not include duty of 1 cent per pound of metallic manganese contained.

| | |
|---|---|
| Brazilian | 34 to 36 cents |
| Indian | 34 to 36 cents |
| Caucasian, (53-55 per cent) | 36 to 38 cents |

## FLUORSPAR

85 and 5 per cent grade

| | |
|---|---|
| Washed gravel, Kentucky and Illinois mines, per net ton | $18.00 |
| Washed gravel, imported duty paid east. tide., gross ton | $20.40 |

## REFRACTORIES

### FIRE CLAY BRICK

Per 1000 f.o.b. works

First Quality

| | |
|---|---|
| Pennsylvania | $43.00 to 46.00 |
| Ohio | 43.00 to 46.00 |
| Illinois | 43.00 to 46.00 |
| Kentucky | 43.00 to 46.00 |
| Missouri | 43.00 to 46.00 |
| Maryland | 43.00 to 46.00 |
| Georgia and Alabama | 40.00 to 45.00 |

Second Quality

| | |
|---|---|
| Pennsylvania | 35.00 to 38.00 |
| Ohio | 35.00 to 38.00 |
| Illinois | 35.00 to 38.00 |
| Kentucky | 35.00 to 38.00 |
| Missouri | 35.00 to 38.00 |
| Maryland | 35.00 to 38.00 |
| Georgia and Alabama | 30.00 to 35.00 |

### SILICA BRICK

| | |
|---|---|
| Pennsylvania | 43.00 |
| Joliet, Ill., East Chicago, Ind. | 52.00 |
| Birmingham | 50.00 to 51.00 |

### MAGNESITE BRICK

Pet Net Ton

| | |
|---|---|
| 9 x 4½ x 2½ | 65.00 |

### MAGNESITE

Net Ton Chester, Pa., and Baltimore base

| | |
|---|---|
| Dead-burned grain magnesite | 40.00 |

### CHROME BRICK

Net ton Chester, Pa., and Baltimore base

| | |
|---|---|
| 9 x 4½ x 2½ | 45.00 |

# Pig Iron

**Market Is Quieter, with Shipments Continuing at March Rate—Advance of 50 Cents Announced by Several Valley Producers**

PURCHASING of pig iron has subsided in all districts, due mainly to heavy contracts placed recently. Some large consumers have not closed for full third quarter requirements, and are expected back in the market soon, while several large pig iron melters allied with building, automotive and railroad industries, have bought for July and August. Large consumption by steelworks is keeping associated furnaces out of the market. Shipments continue at about the March rate. Prices are firm, and several valley producers well booked for second quarter have advanced quotations 50 cents, though the new prices have not been tested. The tendency has been to strengthen foundry iron $18, base, valley, as there has been no recent repetition of $17.50.

**PITTSBURGH, April 16.**—An advance of 50 cents a ton in prices of foundry, bessemer, basic and malleable pig iron has been announced by several producers. Similar action is expected by other furnaces. The new quotations will not receive an adequate test for a number of weeks, as consumers are well covered for the second quarter. New buying is light, only occasional small orders being placed for fill-in requirements. The market is firm on such business at $18, valley, for No. 2 foundry iron and basic, and $18.50 for malleable and bessemer. The advance in prices is not yet general enough to quote a range. Little activity is noted in negotiations for third quarter, although inquiries are received occasionally. Furnace operations continue heavy, with shipments on contracts in large volume.

**Boston, April 16.**—Pig iron sales improved slightly to 3200 tons in the past week. Included in this was several hundred tons of Indian iron, which sold at $22.25 to $22.50, on dock, duty paid. The Mystic Iron Works sold 1200 tons. Practically all Buffalo furnaces are quoting $19 base, Buffalo.

**New York, April 16.**—Sales of pig iron the past week did not exceed 5000 tons. Most consumers have been well provided for the second quarter. Several melters put out inquiries recently but have not closed owing to the prevailing strength of prices. The foundry iron market now appears firmly established at $19, base, Buffalo, for shipment to this territory. This is equivalent to $22.28 to $23.91, delivered, including points having freight rates ranging from $3.28 to $4.91 by all-rail. The open rate on barge shipments through the canal system from Buffalo to Jersey City has settled to $2 a ton, the same as from Buffalo to Beacon. The barge rate to Brooklyn continues $2.50. Pig iron consumption continues heavy.

**Buffalo, April 16.**—Pending pig iron inquiries total about 5000 tons, including the previously reported 2000-ton lot for the New York Air Brake Co. Fill-in tonnage is coming to furnaces in good volume. Shipments are larger than production, with the New York state barge canal opening for traffic this week. Steelworks have practically nothing to offer, and in one or two instances have purchased higher silicon foundry grades from merchants. Prices are firm, with $19.50 the New York state base for foundry and $20 for malleable, subject to 50-cent shading in the East.

**Cleveland, April 16.**—Pig iron sales show further signs of diminishing, while shipments are holding up to the March rate, and prices remain firm. The total of sales booked by furnace interests with headquarters in Cleveland was 12,500 tons in the past week, compared with 25,100 tons in the preceding week and 65,000 tons three weeks ago at the peak of the buying movement for second quarter. Cleveland furnaces are booked practically solid for second quarter. Steelworks are taking iron at a record rate. The local furnaces, however, continue to sell small lots in Cleveland and nearby territory, and are shipping heavily on contracts. Furnace stocks generally are lower than at any time in the past six months. Cleveland furnaces hold to $18.50, base, furnace, for outside delivery, and $19, base, for local consumption. The usual prices for shipments in western Ohio, Indiana and lower Michigan, quoted by nearby lake furnaces, are $20.50, base, furnace for foundry iron and $21 for malleable.

## Pig Iron Prices

Per Gross Ton

| | |
|---|---|
| Bessemer, valley furnace | $18.50 |
| Bessemer, del. Pittsburgh | 20.26 |
| Basic, valley furnace | 18.00 |
| Basic, del. Pittsburgh | 19.76 |
| Basic, Buffalo furnace | 17.50 |
| Basic, del. eastern Pa. | 20.50 to 21.00 |
| Malleable, valley furnace | 18.50 |
| Malleable, del. Pittsburgh | 20.26 |
| Malleable, Cleve. fur. for local del. | 19.00 |
| Malleable, Chicago furnace | 20.00 |
| Malleable, Buffalo furnace | 20.00 |
| Malleable, del. eastern Pa. | 22.26 to 22.91 |
| Malleable, Granite City fur. | 20.50 |
| No. 1 foundry, Chicago furnace | 20.50 |
| No. 1X, eastern del., Phila. | 22.76 to 23.26 |
| No. 1X, Buffalo furnace | 21.00 |
| No. 2 foundry, valley furnace | 18.00 |
| No. 2 foundry, del. Pittsburgh | 19.76 |
| No. 2 plain, Buffalo furnace | 19.50 |
| No. 2 foundry, Chicago furnace | 20.00 |
| No. 2 fdy. Cleve. fur. for local del. | 19.00 |
| No. 2 plain, del., Phila. | 21.76 to 22.26 |
| No. 2 plain, Virginia furnace | 20.75 |
| No. 2 plain, Buffalo, del. Boston | 22.91 to 23.91 |
| No. 2 plain, N. J., tidewater | 22.28 to 22.78 |
| No. 2 Alabama, Bir. base | 15.50 |
| No. 2 Tenn., Birmingham base | 15.50 |
| No. 2 Tenn., del. Cincinnati | 19.19 |
| No. 2 Alabama, del. Cincinnati | 19.19 |
| No. 2 Alabama, del., Chicago | 21.51 |
| No. 2 Alabama, del., Cleveland | 21.76 |
| No. 2 Alabama, del. St. Louis | 19.92 |
| No. 2X, east, N. J., tidewater | 22.78 to 23.28 |
| No. 2X, eastern, del. Phila. | 22.26 to 22.76 |
| No. 2X, foundry, Buffalo furnace | 20.00 |
| No. 2X, Buffalo, del. Boston | 23.41 |
| No. 2X, Virginia furnace | 20.25 to 20.75 |
| Gray forge, val., del. Pittsburgh | 19.26 |
| Low phos., standard, valley | 27.00 |
| Low phos., standard, Phila. | 24.26 to 24.76 |
| Low phos., copper bearing fur. | 23.00 to 23.50 |
| Charcoal, Superior, del., Chicago | 27.04 |

**CANADIAN PRICES**

| | |
|---|---|
| No. 2 foundry, del. Toronto | 24.10 |
| No. 2 foundry, del. Montreal | 25.50 to 26.00 |
| Malleable, del. Toronto | 24.10 |
| Malleable, del. Montreal | 25.50 to 26.00 |
| Basic, del. Montreal | 24.50 to 25.00 |

Silvery iron, Jackson county, O., furnaces, in per cents: 5—$23 to $24; 7—$25 to $26; 8—$26 to $27; 9—$27 to $28; 10—$29 to $30; 11—$31 to $32; 12—$33 to $34; 13—$35 to $36.

Bessemer ferrosilicon, Jackson county, O., furnaces, in per cents: 10—$31 to $32; 11—$33 to $34; 12—$35 to $36; 13—$37 to $38; 15—$41.50 to $42.50; 16—$43 to $44.

**Youngstown, O., April 16.**—Small lots of No. 2 foundry and malleable pig iron continue at $18, valley, for foundry and $18.50 for malleable. Producers are not able to round out yard stocks. Contract shipments and nearby needs are taking practically all the iron that is being produced.

**Detroit, April 16.**—Failure of melters to cover heavily at this time for third quarter is not regarded as a bearish indicator. Normally it is not until May that third and fourth quarter tonnage is placed. Shipments are about on a parity with those of March, and some melters continue to run on a close margin. No. 2 foundry is $20.50, Detroit furnace, and malleable $21, with most users having covered prior to the rise.

**Chicago, April 16.**—Several larger pig iron melters, allied with the building, automotive and railroad industries, have bought for July-August delivery, and even through third quarter. Spot orders constitute the major activity in the market. Shipments are approximately equal to March. The price is steady at $20, base, Chicago furnace.

Sales of silvery iron are more active, with less stocks of higher silicon iron in furnace yards. The tonnage of eastern lake furnace iron sold here for cargo shipment is light.

**Cincinnati, April 16.**—Sales of northern and southern pig iron are light. No inquiries were received and only a few small orders were placed. Prices are steady.

**St. Louis, April 16.**—Purchasing of pig iron has subsided to insignificant

(*Concluded on Page* 1095)

# Coke

**Foundry and Furnace Fuel Shipments Active on Contracts—Spot Demand Quieter**

SHIPMENTS of foundry coke are holding up, some increase being noted in the Connellsville district, while in eastern districts a slight shrinkage is reported. Demand for beehive coke is active on contracts, but the spot market is quiet, and additional ovens have been dropped in the Connellsville district. Standard furnace fuel is available at $2.75.

**Pittsburgh, April 16.**—Beehive coke demand is lagging in the spot market. Shipments of furnace fuel on contracts is heavy, and most producers have little surplus to offer. Additional buying by consumers to supplement previous coverage is lacking, More merchant ovens have been taken off the active list recently and producers are willing to sell surplus coke well below the market price of a month ago. Offerings of standard furnace fuel generally are made at no less than $2.75. No large tonnages, however, are available at that figure. The movement of foundry coke is more active, but little additional buying has developed, and prices are unchanged.

Production of coke in the Connellsville region for the week ended April 6 was 72,295 tons, compared with 73,765 tons the preceding week, according to the *Connellsville Courier*.

**Boston, April 16.**—The return of cold weather stimulated new demand for domestic coke. Foundry fuel continues in strong demand. Prices are steady.

**Detroit, April 16.**—Foundry consumption of by-product coke continues at a record rate, but with domestic requirements ebbing the demand can largely be met locally. The $9, Detroit ovens, price is expected to stand this summer.

**New York, April 16.**—While specifications against foundry coke contracts are fair, spot buying by consumers not under contract is small. Some sellers in this territory believe consumption generally has undergone a slight shrinkage. Prices are unchanged. By-product foundry coke continues $11, delivered at most New England consuming points; $9 to $9.40 delivered at Newark, N. J., and $9, delivered at Philadelphia consuming points. Beehive foundry coke continues $4.85, Latrobe, Pa., and $3.75 to $4, Connellsville. Beehive furnace coke continues $2.75 to $3, Connellsville ovens.

**Chicago, April 16.**—Monthly shipments of by-product foundry coke are setting new records. Since the first of the year output has been at capacity. Prices are steady at $8, ovens, and $8.75 for local delivery.

**Cincinnati, April 16.**—New business in coke is scarce, although specifications are fair, and shipments are going forward steadily. Prices continue firm.

**St. Louis, April 16.**—While coke sales and shipments continue active, offerings are more plentiful than heretofore, and the tone of the market is easier. There are reports of shading on desirable business. By-product operations have been reduced slightly.

**Birmingham, Ala., April 16.**—Coke production is steady, local consumption showing little change. Independent producers are operating above 85 per cent. Foundry coke shipments to distant markets are holding up. This grade remains $5, base, Birmingham.

## Coke Prices

**Prices per Net Ton**

| | |
|---|---|
| **Beehive Ovens** | |
| Connellsville furnace | $2.75 to 2.85 |
| Connellsville foundry | 3.75 to 4.85 |
| New River foundry | 6.00 to 6.50 |
| Wise county foundry | 4.25 to 5.00 |
| Wise county furnace | 3.50 to 4.75 |
| **By-Product Foundry** | |
| Newark, N. J., del. | 9.00 to 9.40 |
| Chicago ovens | 8.00 |
| New England del. | 11.00 |
| St. Louis del. | 9.00 |
| Birmingham, ovens | 5.00 |
| Indianapolis, del. | 8.25 |
| Ashland, Ky., ovens, Connell, basis | 6.50 |
| Portsmouth, O., ovens, Connell, basis | 6.50 |
| Buffalo, ovens | 8.75 |
| Detroit, ovens | 9.00 |
| Philadelphia, del. | 9.00 |

# Ferroalloys

**Specifications Expected To Continue at High Level**

**Pittsburgh, April 16.**—High steelmaking operations are expected to hold ferroalloy demand to present levels well into May. Specifications for ferromanganese and spiegeleisen have not declined materially from the peak demand prevailing over the last 60 days. Consumers have not been forced to place additional business in the spot market, relying generally on specifications against contracts, and current spot prices of $109.79, delivered, Pittsburgh, for ferromanganese and $34 for spiegeleisen are tested only on occasional business, but are firmly held. Prices on special ferroalloys are steady. Some additional inquiry is being received for fluorspar.

**New York, April 16.**—Tungsten continues strong, with ores around $15 a short ton unit, and ferrotungsten $1.30 to $1.35 a pound, contained. Wolframite and scheelite ores are not well established at any figure, due to the fact that almost none is offered. It is probable $15 will soon be passed definitely. Other ferroalloys and ores are strong, but as practically all business is on long contracts there are no changes in prices. Chrome ore is stronger than in a long time.

# Bolts, Nuts, Rivets

**Specifications Are in Large Volume from Many Sources**

NUT AND BOLT PRICES, PAGE 1080

Pittsburgh, April 16.—Specifications for bolts, nuts and rivets are active. Orders for rivets are being received in good volume despite forward buying last month before the $2 a ton advance in large rivets. Jobbers are buying rather freely. Demand from railroad equipment builders is strong, but commitments by railroads are restricted. Production averages about 70 per cent, an increase over the rate a month ago.

**Chicago, April 16.**—With the exception of orders from the building industry, specifications for bolts, nuts and rivets are well diversified. Automotive business has been keeping up with last month. Farm implement specifications show a slight dip, but tractor plant orders are steady. On the whole, specifications are only slightly under a year ago. Bolts and nuts are 60 to 70 off, while small rivets are 70 to 70 and 10 off.

## Revises Specifications

Washington, April 16.—The federal specification board, care of the bureau of standards, is promulgating a new specification to govern government purchases of terne plate for roofing purposes. Criticism and comments are sought by George K. Burgess, chairman of the board, prior to June 1.

## Ferroalloy Prices

(In dollars, except ferrochrome)

| | |
|---|---|
| Ferromanganese, 78 to 82 per cent, tidewater, duty paid | $105.00 |
| Ferromanganese, del. Pittsburgh | 109.79 |
| Spiegeleisen, 19 to 21 per cent, domestic furnace, spot† | 34.00 |
| *Ferrosilicon, 50 per cent, freight allowed, carloads | 83.50 |
| *Do, less carload | 88.50 |
| Do., 75 per cent | 130.00 to 150.00 |
| Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb. con., del. | 11.00 |
| Do., for spot delivery | 11.50 |
| Ferrotungsten, stand., lb. cont. | 1.25 |
| Ferrovanadium, 30-40 per cent, per lb., contained, on analysis | 3.15 to 3.65 |
| Ferro-carbon-titanium carload, producer's plant, net ton | 160.00 |
| Do., one ton to carload | 170.00 |
| Ferrophosphorus, per ton, carload 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent) | 91.00 |
| Ferrophosphorus, electrolytic, per ton, carload, 23-25% f.o.b. Anniston, Ala. (24 per cent) | 122.50 |

†Quantity diff. apply on 100 tons and over.
*These prices contract, spot $5 higher.

# Scrap

## Heavy Melt and Moderate Supply Give Strength to Market—Prices Little Changed

CONSUMPTION of iron and steel scrap continues high as records in steel production are made. Production of scrap materials is not in line and supply of many grades is limited. Prices remain firm and only slight changes are made in adjustment. Consumers have increased resistance to prices on some grades.

**Chicago, April 16.**—Consumption of iron and steel scrap is unabated, while railroad offerings continue below normal and little of the recent heavy shipments of steel to fabricating plants has made its way to the trade in the form of scrap. Material has not appeared in the market as had been expected. Dealer trade is light and does not indicate the strength of demand. Heavy melting steel is firm at $16 to $16.50. Negotiations for large tonnages are under way, in addition to the 5000 tons sold to a leading consumer a week ago at $16.50, gross. Railroad malleable scrap is featured by a strong demand from all users and continued high prices. Carload sales are reported at $20 and more. Consumer resistance is more marked on certain grades. Bookings by dealers, on the other hand, are heavy and shipments are being made steadily with few hold-ups. Rejection of melting steel by consumers recently has been heavy.

**Boston, April 16.**—Except that there was a slightly easier price range for several scrap materials in the past week, the situation remains unchanged. There was some buying for

# Iron and Steel Scrap Prices

**Corrected to Tuesday noon. Gross tons delivered to consumers, except Detroit where dealers' buying prices are shown**

## Steel Works Scrap

**HEAVY MELTING STEEL**

| | |
|---|---|
| Birmingham | 12.00 to 12.50 |
| Boston, dealers | 12.50 to 12.75 |
| Boston, No. 2 | 10.00 to 10.50 |
| Buffalo, No. 1 | 17.00 to 17.25 |
| Buffalo, No. 2 | 14.50 to 15.00 |
| Chicago | 16.00 to 16.50 |
| Cincinnati, deal. | 13.50 to 14.00 |
| Cleveland, No. 1 | 15.75 to 16.00 |
| Cleveland, No. 2 | 15.25 to 15.50 |
| Buffalo, No. 1 | 17.00 to 17.50 |
| Detroit, No. 2 | 12.25 to 12.75 |
| East Pa., del. mill | 17.00 |
| N. Y., deal., R. R. | 13.00 to 13.50 |
| N. Y., deal., yd. | 8.50 to 9.50 |
| Pittsburgh, No. 1 | 18.50 to 19.00 |
| Pittsburgh, No. 2 | 16.50 to 17.00 |
| Pittsburgh, railroad | 19.25 to 19.50 |
| St. Louis, No. 1 | 14.25 to 14.75 |
| Valleys, No. 1 | 18.00 to 18.50 |

**COMPRESSED SHEETS**

| | |
|---|---|
| Buffalo (dealers) | 14.50 to 15.00 |
| Chicago | 14.00 to 14.50 |
| Cleveland | 15.00 to 15.50 |
| Detroit | 14.00 to 14.25 |
| E. Pa. new mat. | 14.50 |
| Pittsburgh | 18.25 to 18.75 |
| Valleys | 18.00 to 18.25 |

**BUNDLED SHEETS**

| | |
|---|---|
| Buffalo | 12.75 to 13.25 |
| Cincinnati, deal. | 11.00 to 11.50 |
| Cleveland | 13.00 to 13.50 |
| Eastern Pa. | 11.50 to 12.00 |
| Pittsburgh | 16.75 to 17.25 |
| St. Louis | 10.00 to 10.50 |

**SHEET CLIPPINGS LOOSE**

| | |
|---|---|
| Chicago | 9.00 to 9.50 |
| Cincinnati | 9.75 to 10.25 |
| Detroit | 9.25 to 9.75 |
| St. Louis | 10.00 to 10.50 |

**STEEL RAILS, SHORT**

| | |
|---|---|
| Birmingham | 13.00 to 14.00 |
| Boston | 11.25 to 12.25 |
| Buffalo | 19.50 to 20.00 |
| Chicago (3 feet) | 19.00 to 19.50 |
| Chicago, 2 ft. and under | 20.00 to 20.50 |
| Cincinnati, deal. | 19.00 to 19.50 |
| Detroit | 17.00 to 17.50 |
| Pittsburgh (3 ft.) | 21.00 to 21.50 |
| Pittsburgh, 2 ft. and under | 21.50 to 22.00 |
| St. Louis | 16.75 to 17.25 |

**STOVE PLATE**

| | |
|---|---|
| Birmingham | 13.00 to 13.50 |
| Boston consumers | 11.50 to 12.00 |
| Buffalo | 13.50 to 14.00 |
| Chicago, net | 12.75 to 13.25 |
| Cinn., deal., net | 10.00 to 10.50 |
| Detroit, net | 9.00 to 9.50 |
| Eastern Pa. | 13.00 to 13.50 |
| N. Y. deal., mill | 8.75 to 9.00 |
| Pittsburgh | 12.50 to 13.00 |
| St. Louis | 13.75 to 14.25 |

**COUPLERS, SPRINGS**

| | |
|---|---|
| Buffalo | 19.00 to 20.00 |
| Chicago | 17.00 to 17.50 |
| Eastern Pa. | 20.00 to 21.00 |
| Pittsburgh | 21.00 to 22.00 |
| St. Louis | 15.75 to 16.00 |

**ANGLE BARS—STEEL**

| | |
|---|---|
| Chicago | 17.50 to 18.00 |
| St. Louis | 15.25 to 15.50 |

**LOW PHOSPHORUS**

| | |
|---|---|
| Buffalo, billets and bloom crops | 19.50 to 20.50 |
| Eastern Pa. | 21.00 to 22.00 |
| Pitts. billet and bloom crops | 23.00 to 24.00 |
| Cleve. billet and bloom crops | 17.50 to 18.00 |

**FROGS, SWITCHES, GUARDS**

| | |
|---|---|
| Chicago | 17.00 to 17.50 |
| St. Louis | 15.50 to 16.00 |

**SHOVELING STEEL**

| | |
|---|---|
| Chicago | 16.00 to 16.50 |
| Cleveland | 11.75 to 12.00 |
| Detroit | 10.75 to 11.00 |
| Pittsburgh | 18.50 to 19.00 |
| St. Louis | 14.00 to 14.50 |

## Iron Mill Scrap

**RAILROAD WROUGHT**

| | |
|---|---|
| Birmingham | 10.50 to 11.50 |
| Boston, dealers | 12.00 to 12.50 |
| Buffalo, No. 1 | 13.50 to 14.00 |
| Buffalo, No. 2 | 16.00 to 17.00 |
| Chicago, No. 1 | 16.75 to 17.25 |
| Chicago, No. 2 | 16.00 to 16.50 |
| Cinn., No. 2 | 13.50 to 14.00 |
| Eastern Pa. | 16.00 to 16.50 |
| N. Y., No. 1 deal. | 12.00 to 12.50 |
| Pittsburgh, No. 2 | 19.25 to 19.50 |
| St. Louis, No. 1 | 13.75 to 14.25 |
| St. Louis, No. 2 | 14.00 to 14.50 |

**SPECIFICATION PIPE**

| | |
|---|---|
| Boston | 10.50 to 10.75 |
| Eastern Pa. | 15.50 to 16.00 |
| New York, deal. | 11.25 to 11.75 |

**BUSHELING**

| | |
|---|---|
| Buffalo, No. 1 | 16.00 to 16.50 |
| Chicago, No. 1 | 14.00 to 14.50 |
| Cinn., No. 1 deal. | 11.00 to 11.50 |
| Cinn., No. 2 | 8.00 |
| Cleveland, No. 1 | 13.00 to 13.50 |
| Cleveland, No. 2 | 11.25 to 11.50 |
| Detroit, No. 1 | 12.25 to 12.75 |
| St. Louis, No. 1 | 10.00 to 10.50 |

**MACHINE SHOP TURNINGS**

| | |
|---|---|
| Birmingham | 8.00 to 8.50 |
| Boston | 6.25 to 6.50 |
| Buffalo | 8.00 to 8.50 |
| Chicago | 9.00 to 9.50 |
| Cincinnati, deal. | 9.00 to 9.25 |
| Cleveland | 9.50 to 10.00 |
| Detroit | 7.25 to 7.50 |
| Eastern Pa. | 11.50 |
| New York, deal | 8.00 |
| Pittsburgh | 11.00 to 11.50 |
| St. Louis | 8.00 to 8.50 |
| Valleys | 11.50 to 12.00 |

**MIXED BORINGS, TURNINGS**
**For blast furnace use**

| | |
|---|---|
| Boston, dealers | 6.50 to 7.00 |
| Buffalo | 11.75 to 12.25 |
| Cincinnati, deal. | 9.25 to 9.75 |
| Cleveland | 11.25 to 11.50 |
| Detroit | 9.00 to 9.25 |
| Eastern Pa. | 10.00 to 10.50 |
| New York, deal | 6.50 to 7.00 |
| Pittsburgh | 12.00 to 13.00 |

**CAST IRON BORINGS**

| | |
|---|---|
| Birmingham, chem. | 13.00 to 13.50 |
| Birmingham, plain | 8.00 to 8.50 |
| Boston, chem. | 10.00 to 10.50 |
| Boston, dealers | 6.50 to 6.75 |
| Buffalo | 11.75 to 12.25 |
| Chicago | 10.50 to 11.00 |
| Cincinnati, deal. | 9.25 to 9.75 |
| Cleveland | 11.25 to 11.50 |
| Detroit | 9.00 to 9.25 |
| Eastern Pa. | 11.00 to 11.50 |
| Eastern Pa., chem. | 14.50 to 15.00 |
| New York, deal | 7.25 to 7.75 |
| Pittsburgh | 12.00 to 13.00 |
| St. Louis | 9.50 to 10.00 |

**PIPE AND FLUES**

| | |
|---|---|
| Cincinnati, deal. | 9.00 to 9.50 |

**RAILROAD GRATE BARS**

| | |
|---|---|
| Buffalo | 13.50 to 14.00 |
| Chicago, net | 13.00 to 13.50 |
| Cincinnati | 10.00 to 10.50 |
| Eastern Pa. | 13.00 to 13.50 |
| New York, deal | 9.25 to 9.75 |
| St. Louis | 13.00 to 13.50 |

**FORGE FLASHINGS**

| | |
|---|---|
| Boston, dealers | 9.50 to 10.00 |
| Buffalo | 13.75 to 14.25 |
| Chicago | 10.50 to 11.00 |
| Cleve. over 10 in. | 14.00 to 14.50 |
| Detroit | 12.00 to 12.50 |
| Pittsburgh (light) | 15.00 to 15.50 |

**FORGE SCRAP**

| | |
|---|---|
| Boston, dealers | 9.00 to 9.50 |
| Chicago | 18.50 to 19.00 |
| Eastern Pa. | 13.50 to 14.00 |

**ARCH BARS AND TRANSOMS**

| | |
|---|---|
| Chicago, net | 21.50 to 22.00 |
| St. Louis | 22.50 to 23.00 |

## Iron, Steel Works Scrap

**AXLE TURNINGS**

| | |
|---|---|
| Boston, deal | 6.75 to 7.00 |
| Buffalo | 14.50 to 15.00 |
| Chicago | 13.00 to 13.50 |
| Cleveland | 12.50 to 13.00 |
| Eastern Pa. | 15.00 to 16.00 |
| Pittsburgh | 16.50 to 17.50 |
| St. Louis | 12.00 to 12.50 |

**STEEL CAR AXLES**

| | |
|---|---|
| Birmingham | 18.00 to 19.00 |
| Boston, ship point | 16.50 to 17.00 |
| Buffalo | 19.50 to 20.00 |
| Chicago | 19.60 to 20.15 |
| Eastern Pa. | 22.75 to 23.00 |
| Pittsburgh | 21.50 to 22.00 |
| St. Louis | 21.00 to 21.50 |

**SHAFTING**

| | |
|---|---|
| Boston, ship point | 14.50 to 14.75 |
| Chicago | 17.35 to 17.90 |
| Eastern Pa. | 19.00 to 20.00 |
| New York, deal | 15.00 to 15.50 |
| St. Louis | 18.50 to 19.00 |

## Irop Foundry Scrap

**CAR WHEELS**

| | |
|---|---|
| Birmingham, iron | 12.00 to 13.00 |
| Boston, iron | 14.00 to 14.50 |
| Buffalo, iron | 14.00 to 14.50 |
| Buffalo, steel | 19.50 to 20.00 |
| Chicago, iron | 15.00 to 15.50 |
| Chi., rolled steel | 19.00 to 19.50 |
| Cincinnati | 12.50 to 13.00 |
| Eastern Pa. cast | 16.50 to 17.00 |
| Eastern Pa., rolled | 19.00 |
| N. Y., iron, deal. | 12.50 to 13.00 |
| Pittsburgh, iron | 16.25 to 16.75 |
| Pittsburgh, steel | 21.00 to 22.00 |
| St. Louis, iron | 15.00 to 15.50 |
| St. Louis, steel | 17.75 to 18.25 |

**No. 1 CAST SCRAP**

| | |
|---|---|
| Birmingham, cup. | 14.00 to 14.50 |
| Buffalo | 16.00 to 17.00 |
| Boston, textile | 16.00 to 16.50 |
| Chicago, mach. | 17.90 to 18.50 |
| Chicago, railroad | 17.35 to 17.90 |
| Chicago, agri. | 16.25 to 16.80 |
| Cincinnati, mach. cupolas, gross | 19.50 to 20.00 |
| Cleveland, cupola | 16.50 to 17.00 |
| Detroit, net | 13.00 to 13.50 |
| East. Pa., cupola | 16.00 to 17.00 |
| N. Y., cup., deal. | 13.00 to 13.50 |
| N. Y., del. local foundries | 17.00 to 17.50 |
| Pittsburgh, cupola | 15.50 to 16.00 |
| San. Fran., del. | 13.50 to 14.00 |
| Seattle | 15.50 to 16.00 |
| St. L. No. 1 mach. | 15.50 to 16.00 |
| St. Louis, No. 1 | 15.00 to 15.50 |
| Valleys | 16.50 to 17.00 |

**HEAVY CAST**

| | |
|---|---|
| Boston | 10.50 to 11.00 |
| Buffalo, breakable | 13.00 to 13.50 |
| Cleve., breakable | 12.50 to 12.75 |
| Detroit, auto., net | 17.00 to 17.50 |
| Detroit, breakable | 9.50 to 10.00 |
| Eastern, Pa. | 16.00 |
| New York, deal | 11.75 to 12.50 |
| Pittsburgh | 13.00 to 14.00 |

**MALLEABLE**

| | |
|---|---|
| Boston, railroad | 16.50 to 17.00 |
| Buffalo | 19.50 to 20.00 |
| Chicago, agri. | 15.50 to 16.00 |
| Chicago, railroad | 19.00 to 19.50 |
| Cinn., R. R., deal. | 15.50 to 16.00 |
| Cinn., agri., deal. | 14.25 to 14.75 |
| Cleveland, rail | 16.00 to 16.50 |
| Detroit, auto | 15.00 to 15.25 |
| St. Louis, rail | 16.50 to 17.00 |

## Miscellaneous Scrap

**RAILS FOR ROLLING**
**5 feet and over**

| | |
|---|---|
| Birmingham | 14.00 to 15.00 |
| Boston, dealers | 12.50 to 13.00 |
| Rails scrap, Boston | 11.00 to 12.25 |
| Skeleton, Boston | 9.50 to 10.00 |
| Buffalo | 16.50 to 17.50 |
| Chicago | 17.50 to 18.00 |
| Eastern Pa. | 18.00 to 18.50 |
| New York | 14.00 to 14.50 |
| Pittsburgh district | 18.00 to 18.50 |
| St. Louis | 16.00 to 16.50 |

**LOCOMOTIVE TIRES**

| | |
|---|---|
| Chicago, cut | 19.00 to 19.50 |
| St. Louis, No. 1 | 15.50 to 16.00 |

**LOW PHOS. PUNCHINGS**

| | |
|---|---|
| Chicago | 18.00 to 18.50 |
| Pittsburgh | 21.50 to 22.00 |

export, but this was not heavy. Railroad wrought, cast iron borings for steelworks, axles, forge scrap, T rails and girders were all quiet.

**New York, April 16.**—Although at least one dealer here has advanced his buying price on No. 1 railroad steel for Bethlehem 50 cents a ton, to $17, delivered, the range of the dealers' buying market here is unchanged. This is true also notwithstanding a reduction of 25 cents a ton on this commodity delivered, Claymont, Del. In neither case has the change been due to further consumer buying, so far as can be learned. In fact, it appears no large consuming purchases of this material have been made recently.

**Buffalo, April 16.**—Additional sales of No. 1 heavy melting steel have been made in tonnage quantities at $17.50 to local steelworks. Dealers also offer this price for material to deliver on contracts. No. 2 steel brings no more than $15, delivered here. Specialties are up fully 50 cents a ton as the result of good demand and small supplies. Malleable is especially scarce.

**Cleveland, April 16.**—Steel mills are asking expedited deliveries, as there is no decline in the melting rate. A cargo of compressed sheet scrap was received by a local mill from Detroit last week. No more $15.50 No. 1 heavy melting steel appears available, the minimum being $15.75, with No. 2 at 50 cents less. Blast furnace material again has stiffened to $11.25 to $11.50, some being bought at those levels. Forge flashings are up $1.

Valley prices continue unchanged, some $18 sales of No. 1 heavy melting steel being noted there. Newspaper reports that $19 was paid there are refuted.

**Cincinnati, April 16.**—Small orders are being placed for iron and steel scrap, but big tonnages still are being anticipated. Despite this quietness, prices continue firm. This is probably because scrap is not abundant.

**Detroit, April 16.**—Strength at Pittsburgh sustains heavy melting steel here at a buying price of $14.50. Malleable is scarce, the automobile grade being advanced 75 cents, to $15 to $15.25. Stove plate is off 50 cents, the leading consumer here having closed its plant. Busheling also reflects strength at Pittsburgh and is up 25 cents. Auto cast is weaker, with another important buyer having shifted to briquetted borings. Dealers cannot detect any marked change in offerings of scrap by automotive producers, though this is likely to result over the next 60 days.

**Philadelphia, April 16.**—Iron and steel scrap is quiet in this market and prices are unchanged.

**Birmingham, Ala., April 16.**—Iron and steel scrap is active, with some heavy melting steel moving northward into Ohio river territory. Recent reductions in pig iron did not affect prices on scrap, which is firm.

**St. Louis, April 16.**—All classes of melters are buying iron and steel scrap and the market is active and strong. As has been the case for some while, steel grades, particularly specialties, are in good demand. Some items in this class were marked up fractionally, among them angle bars and steel wheels and springs. Iron car wheels were also fractionally higher at $15.25 to $15.75.

## Canadian Scrap

**Dealers' Buying Prices**

**MONTREAL**

**Per Gross Ton**

| | |
|---|---|
| Iron axles | $22.00 |
| Steel axles | 20.00 |
| Car wheels | 16.00 |
| Stove plate | 13.00 |
| Wrought pipe | 6.00 |
| Turnings | 6.50 |
| Heavy melting steel | 8.00 |

**TORONTO**

| | |
|---|---|
| Steel axles | 15.00 |
| Iron axles | 17.00 |
| Heavy melting steel | 9.50 |
| Turnings | 7.50 |
| No. 1 mach. cast (net) | 16.00 |
| Malleable (net) | 14.00 |

**Pittsburgh, April 16.**—Buying of iron and steel scrap is scarce and prices generally are steady. Steel is unchanged. Heavy melting steel on the April list of the Pennsylvania railroad brought $19.25 to $19.50 at the usual differential over No. 1. Compressed sheets have declined 25 cents on large supply. Several other grades have declined slightly. Most melters are well supplied and are not buying freely.

**Toronto, Ont., April 16.**—Hamilton mills are taking in small tonnages of steel scrap, but orders for iron grades are increasing from this district. Consumers in Ontario are pressing for delivery of iron grades and orders are appearing at frequent intervals. In the Montreal market demand is increasing for iron and steel grades. Supply is better than a few weeks ago and the recent advance in dealers' buying prices and better weather conditions have brought out larger tonnages. Prices are firm and unchanged.

## Semifinished Steel

### Demand Continues Strong—Chicago Buying Pittsburgh Billets

SEMIFINISHED STEEL PRICES, PAGE 1080

**Pittsburgh, April 16.**—Practically all grades of semifinished steel continue in urgent demand, but current high steelmaking operations have failed to materially increase available supplies of billets, slabs and sheet bars. Present backlogs of bars, sheets and strips appear to require practically all of the steel output well into May. Occasional interferences with operations of nonintegrated producers are heard. Current prices of $34 for 4 x 4-inch rerolling billets and slabs, and $35 for sheet bars are firm, with reports of premiums in certain instances where material is urgently required. Demand for skelp is fair, and delivery in instances is deferred three to four weeks. Wire rods are firm and active at $42.

**New York, April 16.**—Demand for wire rods continues heavy. Mills which recently were threatened with a scarcity of rods, have been able to increase their production, and there is tonnage to supply all requirements. The price continues $42, base, Pittsburgh.

**Chicago, April 16.**—Semifinished steel consumers have purchased billets in the Pittsburgh district as high as $36 to $37, base. Billet quotations in the Chicago district remain nominal as mills are unable to offer any material in the open market. The base price of $35, Chicago, for billets, it is said, does not represent the market. Some sales of wire rods are reported on the basis of $42, Pittsburgh-Cleveland, or $43, Chicago.

**Youngstown, O., April 16.**—Consumers of billets, sheet bars and slabs have been vying with each other to persuade makers to ship tonnage in excess of contract requirements, but without success. These consumers now express themselves as being in luck if they can get full contract shipments. Billets and slabs are strong at $34, and sheet bars at $35, Pittsburgh and Youngstown.

## Iron Ore

### Ford Company Closes with Four Producers—Lake Season Opens

IRON ORE PRICES, PAGE 1080

**Cleveland, April 16.**—Vessel shipments of Lake Superior iron ore now are on their way to lower lake ports, and the first cargoes will arrive this week. As most users have placed contracts or specified on long-term contracts for the season the market is quiet. The Ford company purchased about 20,000 tons less than called for in its inquiry. The tonnage was divided among four producers, two of them taking about one-third each and the other third being divided between the two remaining companies. Sellers report the company paid the full schedule of open market prices, which were established March 22 at an advance of 25 cents over last year's levels. The inquiry called for 200,000 tons of basic. This was reduced by about 20,000 tons. The company also asked for 77,000 tons manganiferous iron ore, 33,000 tons of silicious ore and 44,000 tons of high phosphorus. It increased the proportion of silicious ore slightly, while buying practically the full amount of manganiferous and high phosphorus. The total of its purchase this year is approximately 100,000 tons less than the total in 1928. The Ford company is now getting into production at its new Blueberry iron ore mine, near Ishpeming, Mich., and will ship about 50,000 tons from the mine this year. It will increase production at its Imperial mine about 25,000 tons over 1928. The remaining difference will be largely accounted for by use of scrap. It is operating its two blast furnaces, and will need fully as much, if not more, iron ore this year than it did in 1928.

# Bars

**Mills Unable to Gain on Backlogs—Capacity Operation Assured for Some Weeks to Come**

MILLS continue to add tonnage to their bar backlogs, despite heavy coverage for second quarter. Deliveries continue deferred and producers are unable to make much progress in reducing tonnages. Equipment long under capacity demands seems likely to cause pause for repairs before long. Capacity operations are indicated for several weeks.

BAR PRICES, PAGE 1079

**Chicago, April 16.**—Finished steel tonnage is being added to mill books, despite the heavy and practically complete second quarter coverage in a number of lines. Contract and spot sales remain slightly above the weekly averages for this year. No relief has appeared in bar mill deliveries, which are 12 weeks and over. In view of current backlogs, mills are planning on present operations for at least 60 to 90 days. Possibility is seen that mill and furnace equipment, having undergone prolonged capacity performance, may require repair work soon, tending to reduce output and help maintain tight deliveries. Bar mill orders, as for some months, are well diversified. Road machinery builders are taking more uniform requirements and are distributing work throughout the off seasons of their sales. Implement and tractor plants show no let-down. Heavy automotive schedules for this month require heavy tonnages of forged parts and cold finished steel. Drop forgers in the Chicago district have large programs. Car shops are taking increased bar requirements.

Soft steel bars are 2.05c to 2.15c, Chicago, except to preferred industries. Buyers continue to pay warehouse prices for quick delivery from stock.

Alloy steel bar mills are operating at capacity with prices unchanged. Bar iron is 2.05c to 2.15c, Chicago. Rail steel bars are 1.95c, Chicago Heights, to the manufacturing trade. Industrial and rail steel fence post orders are steady. Rail steel bar mills are operating near capacity.

**Pittsburgh, April 16.**—Specifications for merchant steel bars are surprisingly large in view of heavy business placed during March. Current demand is less active than the abnormal rate of a month ago which is only natural in view of substantial buying in closing out first quarter contracts. Heavy operations of mills have served to decrease backlogs slightly, and deliveries have been shortened. Current promises are now closer to three weeks than the three to four weeks prevailing earlier this month. Demand continues well diversified with specifications from automotive interests showing no more of a decrease than the general average. Current backlogs indicate heavy operations well into May.

**Cleveland, April 16.**—Some makers of soft steel bars have experienced a slight easing in specifications the past few days, and April business to date is somewhat below the comparable period of March. Deliveries, however, seem to be as extended as ever. Automotive demand is a shade less pronounced. Prices continue firm, makers asking 1.95c, base, Cleveland, on customary lots, with outside mills quoting 1.95c to 2.00c, delivered Cleveland.

**Detroit, April 16.**—Soft steel bar shipments into this district in March set a new monthly record, and thus far in April this rate has been substantially maintained. Specifications show no appreciable change for 30 days. A slight tendency by some automotive users not to commit themselves quite so far ahead is reported; this is considered natural following a record quarter and has not affected pressure for immediate shipment. The customary quotation on soft steel bars is 1.95c, Cleveland or Pittsburgh base, according to the mill.

**Philadelphia, April 16.**—Steel bar consumption in this territory continues heavy. So far there has been little specifying against second quarter bar contracts because of the extent to which the mills owe tonnage against first quarter arrangements. The current market, however, is firm at 1.95c to 2.05c, base, Pittsburgh.

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Holland Furnace Co., Holland, Mich., reports net profit for 1928 of $1,245,189, compared with $1,229,215 in 1927.

# Plates

**Market Active and Strong—Large Tonnages Scheduled in Middle West—Prices Unchanged**

PLATE demand continues brisk, and prices are firm. Deliveries have become extended beyond 12 weeks in the Chicago district, while the majority of eastern mills cannot ship before four to six weeks. A Milwaukee fabricator has scheduled 75,000 tons of plates for delivery from the Chicago district this month. Car shop specifications are increasing.

PLATE PRICES, PAGE 1079

**Pittsburgh, April 16.**—Plate specifications are being received at the slower rate that marked the turn of the quarter but shipments are heavier than a month ago. Most mills have fairly heavy backlogs and new business has developed in good volume during recent weeks. Builders of river barges, freight cars and pipe lines account for the bulk of new tonnage. The market is generally well maintained at 1.95c, Pittsburgh, on new business.

**New York, April 16.**—While certain eastern platemakers can give shipment within two weeks, the majority are filled up for four to six weeks. Demand generally shows great vitality, and the oil industry is practically the only buyer whose requirements have fallen off. Many steel pipe line projects are pending. The city of Albany has thrown out bids for cast iron pipe and will call for new bids. It is expected bids for fabricated steel pipe will be taken as well as for cast iron pipe. The project in steel pipe would require about 14,000 tons of plates. Other pipe lines which are expected to come out for bids shortly are to be located in Hartford, New Britain, Brooklyn, Newark, Boston and Rochester. Detroit will open bids May 8 on a line to take about 1600 tons of plates. Plates are firm at 2.05c to 2.15c, base, Coatesville, and 1.95c to 2.05c, base, Pittsburgh. The Newport News Shipbuilding & Dry Dock Co. will furnish about 1500 tons of fabricated plate work in connection with a power generating plant in Russia awarded to General Electric Co. by Amtorg Trading Corp.

**Chicago, April 16.**—No relief has been obtained on plate deliveries, which have been extended more than 12 weeks in many instances. More tonnage has been added to mill books with the award of 145,000 tons of gas line pipe for the Mississippi River Fuel Corp., consisting of 554 miles, from Monroe, La., to St. Louis, the larger part going to a Milwaukee fabricator of welded pipe. This fabricator has scheduled about 75,000 tons of plates for delivery from Chicago district mills this month. In addition, 4000 tons in miscellaneous oil tank tonnage was booked. Car shop specifications are growing and have not yet reached their maximum. Both sales and specifications on plate material are above the weekly average for this year. Barring mill breakdowns,

present operations are scheduled to continue for at least 60 to 90 days. The market is 2.05c to 2.15c, and prevails except for tonnage differentials.

**Philadelphia, April 16.** — Eastern plate mills continue to operate at about 80 per cent, or substantially full. While shipments can be made in a week or two in some instances, most mills are booked for four to six weeks, with apparently no letup in demand in sight. The New York Shipbuilding Co. booked four barges for the Erie railroad, each requiring about 1000 tons of steel, mainly plates. Plate prices are firm at 2.05c to 2.15c, base, Coatesville, on new business.

**Cleveland, April 16.**—Miscellaneous plate orders over a scattered territory for different purposes are small individually but in the aggregate fairly large. One local plate mill operates at 75 per cent, specifications being active in lots of 50 to 250 tons at a time. One large tonnage is up, thought to be for a lake tanker—2500 tons. Deliveries are deferred from three to four weeks as a rule. Additional locomotive shop tonnage is pending. Plates are 1.95c, Pittsburgh.

### CONTRACTS PLACED

500 tons, Vancouver, B. C., water main project, to English producers.

175 tons, boiler for Snoqualmie Falls Lumber Co., plant in Washington, to Puget Sound Machinery Depot.

175 tons, 14 pontoons for U. S. Engineers, Louisville district; to Marietta Mfg. Co.

### CONTRACTS PENDING

2500 tons, Great Lakes tanker.

240 tons, 4 to 16-inch welded or riveted pipe, Sierra Madre, Calif. Bids received.

## Stainless Alloys Cause Central to Expand

An important program of improvements, costing approximately $1,000,000, is being carried out by the Central Alloy Steel Corp., Massillon, O., over the first half of the year. A substantial portion of the expenditure is for expansion in connection with the manufacture of the new Krupp nirosta stainless alloys.

As a part of this program, the company is constructing a new induction reclaiming furnace at a cost of $245,000. This equipment, which will be in operation by July 1, will permit the reclaiming of stainless steel scrap without the loss of chromium and nickel. Such reclamation of valuable alloys has become a factor of increasing importance with the widening use of stainless steel.

Other important improvements include the construction of a new billet cleaning building at a cost of $370,000, and a new soaking pit costing $90,000 at the Canton, O., plant.

# Pipe

**Larger Work Postponed—Several Tonnages Awarded—1000-Mile Gas Line Coming Up**

POSTPONEMENTS rule in connection with larger cast pipe projects. New bids close April 24 at Albany on 30,000 tons. Grand Rapids, Mich., also defers action. Chicago bought 985 tons and Columbus, O., soon will buy 1300 tons. Bids are to be asked on a 1000-mile 20-inch gas line to Birmingham, Ala. Cast prices generally hold firm. Lorain mill schedules are heavier.

PIPE PRICES, PAGE 1080

**Chicago, April 16.**—Cast pressure pipe projects are disappointingly slow in materializing. A fair amount of carload tonnage is reported. Several projects are pending in the North Central markets, but fresh business has not met expectations thus far. The Chicago program for this summer will be important. Chicago department of public works has just purchased 985 tons of 12-inch pipe. Columbus, O., has 1300 tons of 4 to 24-inch pipe pending. Receipt of bids for the Grand Rapids, Mich, sewage treatment works has been postponed indefinitely. Chicago delivered prices for carload orders are reported steady at $45.20 to $46.20.

**New York, April 16.**—New bids have been asked by Albany, N. Y., on approximately 30,000 tons of 48-inch cast pipe to be opened April 24. The cast pipe market otherwise is dull, with few outstanding awards or inquiries. Prices are easy.

**Pittsburgh, April 16.**—Slight improvement is noted in demand for merchant pipe in keeping with increased building construction activity. Lapweld pipe continues slow and seamless material demand from the oil country still is restricted. Boiler and mechanical tubing, however, continue active. Bids are being asked on portions of the large 20-inch gas line to be laid from Monroe, La., to Birmingham. This line will be about 1000 miles long and may extend into Georgia. A number of companies will be affiliated in ownership of this line.

**Cleveland, April 16.**—Buttweld pipe demand has improved over recent weeks. Jobbers in some cases have had to anticipate needs more than has been necessary in several months. They, however, confine their orders to one to three carloads at a time. Because some are enjoying a better turnover, these orders are more frequent, although building conditions are less extensive locally than a year ago. Operations of the Lorain, O., plant of the National Tube Co. are advancing this week to 73 per cent.

**Birmingham, Ala., April 16.**—Cast iron pressure pipe shops are operating at about 80 per cent. Lettings are coming in fairly well and shipments are steady. The price base is firm at $37 to $38 on 6-inch sizes, with less than carloads carrying a higher price. Unfilled tonnage is being worked down as shipments are exceeding output. Much pipe is shipped to the West and Northwest from here. Specifications in sight include Detroit and Akron tonnages which are above the average in size.

### CONTRACTS PLACED

985 tons, 12-inch pipe for Chicago department of public works, to Glamorgan Pipe & Foundry Co., at $45, delivered.

350 tons, 6, 8 and 12-inch pipe for Whitefish Bay, Wis.; awarded through contractor.

309 tons, 6 and 8-inch class 150, Sacramento, Calif., to United States Cast Iron Pipe & Foundry Co.

300 tons, 6, 8, 10 and 12-inch monocast for Edmonton, Alta., to American Cast Iron Pipe Co.

### CONTRACTS PENDING

30,600 feet, 22,000 feet of 6-inch, 7400 feet of 4-inch, and 1200 feet of 8-inch pipe for Spencerville, O.; T. C. Brooks & Sons Co., low bidder on contract for laying.

30,000 tons, 48-inch cast pipe, Albany, N. Y.; bids rejected with new opening scheduled for April 24.

1300 tons, 4 to 24-inch pipe for Columbus, O., to be awarded sand cast instead of centrifugal; James B. Clow & Sons low bidder at $43, delivered.

1000 tons, 24-inch class B pipe for a water utility company, New York, for installation at a Mid-West point.

500 tons, 6 and 8-inch pipe for Saginaw, Mich.; James B. Clow & Sons low at $45.30 delivered.

215 tons, 4 and 6-inch class C, improvement El Prado avenue, San Diego, Calif. General contract to George R. Daley.

144 tons, 4 and 6-inch class B, improvement Plata avenue, San Diego, Calif. General contract to George R. Daley.

## Superior Steel Corp. Is Under New Control

Pittsburgh, April 16.—No change in personnel of the Superior Steel Corp., Pittsburgh, is contemplated following confirmation of the passing of control from the present executives to a group that had been large stockholders for a number of years. Members of this group are located in Binghampton, N. Y., New York, and Pittston, Pa. George S. Buss, Pittston, was elected to the board of directors at the annual meeting March 18.

An important factor in the improved outlook for the Superior company is a contract from the Rustless Iron Corp. of America, Baltimore, for the

exclusive right for the conversion of this metal into strip. Frank R. Frost, president of Superior Steel Corp., is a director of the Rustless Iron corporation.

Operations of the company in production of hot and cold rolled steel strip have been at capacity since Jan. 1. Profits for January and February showed a sharp increase over preceding periods, although they did not reflect earning from sale of new rustless product, which only recently has been placed in active production.

## Tin Plate

**Operations Increased, With June Specifications In Hand**

TIN PLATE PRICES, PAGE 1080

**Pittsburgh, April 16.**—Most tin plate consumers have forwarded specifications for material for June delivery, and mills in this district have increased production about two points. The average now is 97 per cent. The largest tin plate buyers have increased requirements over the rate a year ago. Operations of canmakers have increased over the past few weeks and this industry is expected to make further gains in tin plate consumption over the remainder of the first-half. Tin plate continues $5.35 per 100-pound base box, Pittsburgh.

## Unfilled Orders Highest in 3 Years

When unfilled orders of the United States Steel Corp. increased 266,377 tons as of March 31 they rose to 4,410,718 tons or the highest since Feb. 28, 1926. The increase is the more significant because of March's record production. A year ago unfilled orders were slightly lower, or 4,335,206 tons. Comparisons follow:

| Date | Total | Change, tonnage | Change, per cent | |
|---|---|---|---|---|
| Mar. 31, 1929 | 4,410,718 | 266,377+ | 5.7 | + |
| Feb. 28, 1929 | 4,144,341 | 34,854+ | 0.84 | + |
| Jan. 31, 1929 | 4,109,487 | 132,775+ | 3.34 | + |
| Dec. 31, 1928 | 3,976,712 | 303,712+ | 8.25 | + |
| Nov. 30, 1928 | 3,673,000 | 78,030— | 2.80 | — |
| Oct. 31, 1928 | 3,751,030 | 52,662+ | 1.42 | + |
| Sept. 30, 1928 | 3,698,368 | 74,325+ | 2.05 | + |
| Aug. 31, 1928 | 3,629,042 | 53,116+ | 1.40 | + |
| July 31, 1928 | 3,570,927 | 66,082— | 1.81 | + |
| June 30, 1928 | 3,637,009 | 220,187+ | 6.45 | + |
| May 31, 1928 | 3,416,822 | 455,311— | 11.70 | — |
| Apr. 30, 1928 | 3,872,133 | 463,073— | 10.70 | — |
| Mar. 31, 1928 | 4,335,206 | 62,983— | 1.43 | — |
| Feb. 29, 1928 | 4,398,189 | 122,242+ | 2.80 | + |
| Jan. 31, 1928 | 4,275,947 | 303,073+ | 7.62 | + |
| Dec. 31, 1927 | 3,972,874 | 518,430+ | 15.00 | + |
| Nov. 30, 1927 | 3,454,444 | 113,404+ | 3.39 | + |
| Oct. 31, 1927 | 3,341,040 | 192,921+ | 6.10 | + |
| Sept. 30, 1927 | 3,148,113 | 47,924— | 1.49 | — |
| Aug. 31, 1927 | 3,196,037 | 54,023+ | 1.70 | + |
| July 31, 1927 | 3,142,014 | 88,768+ | 2.80 | + |
| June 30, 1927 | 3,053,246 | 2,305+ | 0.075 | + |
| May 31, 1927 | 3,050,941 | 405,191— | 11.70 | — |
| Apr. 30, 1927 | 3,456,132 | 97,008— | 2.72 | — |
| Mar. 31, 1927 | 3,553,140 | 43,979— | 1.22 | — |
| Feb. 28, 1927 | 3,597,119 | 203,058— | 5.34 | — |
| Jan. 31, 1927 | 3,800,177 | 160,792— | 4.50 | — |

Long Island Structural Steel Co., Inc., Poughkeepsie, N. Y., will increase its capital from $10,000 to $100,000. William Greenfogel, 331 Madison avenue, New York, is attorney for the company.

# Sheets

**Market Active—Black and Galvanized Easier—Lack of Sheet Bars Delays Mill Operations**

DEMAND for sheets continues heavy, and prices generally are firm, except for some softness noted occasionally in black and galvanized. Shortage of sheet bars has restricted mill operations in the Pittsburgh and Chicago districts. Deliveries of autobody sheets cannot be assured in less than five weeks, from the Pittsburgh district. Third quarter buying well underway at Buffalo.

SHEET PRICES, PAGE 1079

**Pittsburgh, April 16.**—Sheet bar requirements rather than new business is occupying the attention of sheetmakers. Mills are well booked over the remainder of the quarter, and recent heavy operations have restricted supplies of semifinished steel. Sheet mill operations in several instances have been restricted due to lack of sufficient sheet bar supplies. Production, as a result has declined a few points in this district, and deliveries and backlogs have been increased correspondingly. New specifications have been surprisingly active in view of heavy coverage at the end of the first quarter. Mills are able to command new prices on most of the business being placed, although occasional shading is reported on black and galvanized material. Current prices generally are 2.95c, Pittsburgh, on black, 3.00c for tin mill black, 3.70c for galvanized, 2.20c for blue annealed, and 4.10c for autobody.

**New York, April 16.**—Consumption of sheets is heavy. A few mills are sold up six to eight weeks, the best situation for them since the war. Some mills can take orders for only certain kinds of sheets which will fit into schedules. The current market is firm at 2.20c, base, Pittsburgh, for blue annealed 2.95c for black, and 3.70c for galvanized.

**Buffalo, April 16.**—Demand for sheets shows no slowing up. All sellers are asking 3.215c, Buffalo, for black, and 4.365c for full finished. Third quarter buying is well underway. Warehouses are getting a heavy volume of orders.

**Cleveland, April 16.**—Sheet orders are accumulating and deliveries are increasingly deferred. Some mills now are accepting business for July shipment at prices to be established later. Practically full operations obtain, except where semifinished shortage prevents. Some intercompany mills are switching sheet bars to bridge gaps. Even eight weeks are sometimes required for shipment of ordinary grades in some cases. Most price levels are firm, although occasionally minor concessions arise, particularly on blue annealed and galvanized. Local mills are running full.

**Detroit, April 16.**—Pressure for delivery of sheets, especially full finished, continues insistent. March shipments were a record, and April reveals no slackening. An important maker looks for May shipments to be unusually high, though somewhat under the level of the first quarter, with a letdown in June and July shipments for July and August assembling. Autobody sheets are firm at 4.10c, base, Pittsburgh. Blue annealed sheets are 2.10c. Black sheets are quoted at 2.85c, but material is being shipped at 2.75c.

**Youngstown, O., April 16.**—Sheet mills have difficulty in obtaining sufficient sheet bars to continue operations at present rates; and also in making deliveries. Operations today are at about 94 per cent of independent capacity, against 93 per cent. last week.

Makers of autobody sheets here hold firmly to 4.10c, Pittsburgh, and of blue annealed to 2.20c. Some softness is apparent in common black, according to reports from adjoining districts. This softness is said to have resulted in prices of 2.80c and even 2.75c. In this district, however, makers refuse to shade the common black price of 2.95c, and on galvanized at 3.70c.

**Chicago, April 16.**—Sheet mill operations are restricted by shortages in semifinished steel. The operating rate for the district is 85 per cent, with one group of hot mills on a five-day weekly basis, but with backlogs that would warrant full time operations. Buyers are exerting pressure to get on mill books in view of the generally tight deliveries. The market has been featured by more forward buying than recently. Deliveries on black, galvanized and blue annealed have been extended to seven weeks. Chicago delivered quotations are steady at 3.10c for No. 24 black, 3.85c for No. 24 galvanized, and 2.35c for No. 10 blue annealed, with Gary and Indiana Harbor prices $1 a ton lower.

**Philadelphia, April 16.**—Consumption continues heavy, but new buying is light. Consumers are well covered ahead as a result of heavy first quarter specifications. The extent of such specifications is just becoming apparent, all mills having large order books. Some are booked up for the entire second quarter, with runovers into July. Prices are firm. Blue annealed sheets generally are 2.20c, base, Pittsburgh, and 2.10c is highly exceptional. Black sheets are firm at 2.95c, aside from some differentials on automotive requirements. Galvanized sheets are 3.75c, except to some large jobbers.

# Structural Shapes

**Below Last Week's High, Awards for Week Continue Heavy—Much Work Pending Promises Continuance of Activity**

SOMEWHAT less than last week's record-breaking total of 80,331 tons, structural awards continue to roll up high weekly aggregates. The compilation this week involves a 12,000-ton bank in Toronto; a 4500-ton steel plant in Monroe, Mich.; a 4600-ton county building at Pittsburgh; a 4000-ton office building at New York and some other large work there. Numerous pending items presage a continuance of present good business, including 10,000 tons of bridge work at Chicago. Several large jobs are up in the East. Because of specifications from car builders, western structural shops now promise seven to eight-week deliveries. April production of plain material is reported equal to that of March. Prices of plain material continue firm. Bids show keen competition.

STRUCTURAL SHAPE PRICES, PAGE 1079

**New York, April 16.**—Structural buying is relatively light in the East, although one large contract, details of which are to be announced later, has been placed. Inquiry has been issued for a hotel to take 6000 to 8000 tons. Meanwhile, leading structural mills are running at a record rate. On subway section 6, route 107, John Kennedy, general contractor, is low.

**Philadelphia, April 16.**—The firmer price tone reported in the shape market last week continues. Current range of prices here on new business is 2.00c to 2.05c, base, mill, with the tendency toward 2.05c as a minimum. Delivered prices on shapes at Philadelphia are 2.06c to 2.11c. Eastern shape mills are operating at 80 to 90 per cent and a continuation of present good business is indicated by the large structural list pending.

**Pittsburgh, April 16.**—New structural steel work is expanding gradually, although the bulk of current business is restricted to small-lot jobs. The Allegheny county building here, 4600 tons, was let to the McClintic-Marshall Co. Fabricators report an increased volume of new business, with large tonnages generally lacking, however. Specifications for plain structural material are steady, with material being shipped against first quarter contracts. Producers are holding to 1.95c, Pittsburgh, on new orders.

**Cleveland, April 16.**—Local fabricators are informed that the 4500-ton plant at Monroe, Mich., for the Newton Steel Co., was awarded Whitehead & Kales Co. The South avenue bridge at Youngstown, O., reported to involve about 1000 tons, went to the American Bridge Co., which also was awarded the Broadway telephone exchange building here. The Republic Structural Iron Works was awarded two small jobs, 250 and 115 tons, respectively. Warehouse No. 4 for the Nickel Plate railroad went to Massillon Bridge & Structural Co. Structural specifications received by the mills are fairly large from week to week. The market is said to be firm at 1.95c, Pittsburgh.

**Chicago, April 16.**—Increasing mill orders from car building shops are responsible largely for lengthening of deliveries on plain structural material. Shipments now are seven to eight weeks deferred, against four to five weeks recently. New sales are reported for specific work, but second quarter contracting largely has been completed. Fresh inquiry involves about 10,000 tons of bridge work. Building inquiry is light. Fabricators have been unable to build up stocks because of the tightening deliveries. The price of plain material to miscellaneous buyers is 2.05c to 2.15c, Chicago.

**Birmingham, Ala., April 16.**—Four of the larger contracts for structural steel recently placed with fabricators in Birmingham call for 5600 tons of steel. Smaller orders will more than double that total. Shops here are operating close to 90 per cent.

## Awards Compared

| | Tons |
|---|---|
| Awards this week | 52,366 |
| Awards last week | 80,331 |
| Awards two weeks ago | 44,717 |
| Awards this week in 1928 | 29,505 |
| Average weekly awards, March | 49,265 |
| Average weekly awards, 1928 | 39.082 |
| Average weekly awards, 1929 | 42,239 |
| Total awards to date, 1928 | 635,277 |
| Total awards to date, 1929 | 675,831 |

## CONTRACTS PLACED

12,000 tons, building, Canadian Bank of Commerce, Toronto, Ont., to Hamilton Bridge Works.

4600 tons, Allegheny county building, Pittsburgh, to McClintic-Marshall Co.

4500 tons, plant, Newton Steel Co., Monroe, Mich., to Whitehead & Kales Co.

4000 tons, office building, Forty-first street and Madison avenue, New York, to A. E. Norton Inc.

3500 tons, office building, 625 Madison avenue, New York, to McClintic-Marshall Co.

3000 tons, telephone building, Atlanta, Ga., to Virginia Bridge & Iron Co.

2000 tons, office building Sun Life Assurance Co. of Canada, Montreal, Que., to Dominion Bridge Co.

2000 tons, bridge, Kanawha river, Charleston, W. Va., to Fort Pitt Bridge Co.

2000 tons, Midland Bank building, Cleveland Union Terminal Co. group, Cleveland, to American Bridge Co.; in addition to 7000 tons noted last week.

1400 tons, seven airplane hangars in South America, to Virginia Bridge & Iron Co.

1000 tons, automotive building, Canadian National railways, Toronto, Ont., to Reid & Brown Structural Steel & Iron Works.

1000 tons, Jewish seminary, Broadway and 122nd street, New York, to Bethlehem Fabricators, Inc.

1000 tons, power plant, Ponca City, Okla., to Kansas City Structural Steel Co.

1000 tons, South avenue bridge, Youngstown, O., to American Bridge Co., on its bid of $233,950 by Mahoning county commissioners.

900 tons, powerhouse, Detroit Edison Co., Detroit, to McClintic-Marshall Co.

800 tons, bridges, Louisville & Nashville railroad, to Virginia Bridge & Iron Co.

750 tons, apartment hotel, 1301 Astor street, Chicago, to New City Iron Works.

700 tons, loft, Thirty-fourth street and Seventh avenue, New York, to McClintic-Marshall Co.

500 tons, laboratory, Aluminum Co. of America, New Kensington, Pa., to McClintic-Marshall Co.

425 tons, Broadway Exchange building, Cleveland, for Ohio Bell Telephone Co., to American Bridge Co.

400 tons, garage, Members' Garage Co., Dodge court, Cleveland, to Pittsburgh Bridge & Iron Co. through the Craig-Curtis Co. general contractor.

400 tons, repair shop, Chicago, Rock Island & Pacific railroad, El Reno, Okla., to Virginia Bridge & Iron Co.

350 tons, St. Mary's Roman Catholic church, Philadelphia, to Bethlehem Fabricators Inc.

300 tons, Church of the Holy Child, Philadelphia, to Montgomery Iron & Steel Co.

270 tons, parochial school, Homestead, Pa., to John Eichleay Jr. Co. through Morgan & Co., general contractor.

250 tons, airport buildings, Alhambra, Calif., to Pacific Iron & Steel Co.

250 tons, industrial building, Belden Mfg. Co., Richmond, Ind., to Insley Mfg. Co., through J. W. Mueller & Co., general contractors.

250 tons, building, Sullivan Machinery Co., Michigan City, Ind., to Worden-Allen Co.

230 tons, conveyor system, Detroit Edison Co., Detroit, to Russel Steel Construction Co.

205 tons, warehouse No. 4, Nickel Plate railroad, Cleveland, to Massillon Bridge & Structural Co.

200 tons, state highway bridge, Connecticut, to American Bridge Co.

200 tons, apartment, Pine and Monroe streets, San Francisco, to Western Iron Works.

180 tons, plant extension, Bay City Dredge Co., Bay City, Mich., to Wisconsin Bridge & Iron Co.

175 tons, overhead crossing, La Cienega boulevard, Los Angeles, to Consolidated Steel Co.

170 tons, state bridge, New Jersey, to Rust Engineering Co.

150 tons, high school, Ninety-second avenue, Los Angeles, to unstated interest.

130 tons, girder spans, Chicago, Rock Island & Pacific railroad, to American Bridge Co.

125 tons, building, Scott-Fetzer Co., Cleveland, to Republic Structural Iron Works, through H. E. Klefman Co., general contractor.

121 tons, warehouse addition, Indiana street, San Francisco, to Mortensen Construction Co.

120 tons, hotel, Fulton and Fillmore streets, San Francisco, to McClintic-Marshall Co.

115 tons, St. Thomas-Aquinas parochial school, Cleveland, to Republic Structural Iron Works, through Charles Shutrump & Sons Co., general contractor.

100 tons, plant, Decker Screw Products Co., Albion, Mich., to Indiana Bridge Co.

100 tons, plant, Hart Glass Co., Dunkirk, Ind., to Indiana Bridge Co.

100 tons, power house, city of Coldwater, Mich., to Indiana Bridge Co.

100 tons, garage, Chicago, to McClintic-Marshall Co.

100 tons, miscellaneous bridge work, Chicago,

Burlington & Quincy railroad, to unstated fabricators.
100 tons, plant addition, Bridgeport, Conn., to American Bridge Co.
100 tons, city hospital addition, Providence, R. I., to Providence Steel & Iron Co.

## CONTRACTS PENDING

6000 to 8000 tons, 40-story Pierre hotel, Sixty-first street and Fifth avenue, New York. General contract to Geo. A. Fuller Co.
5000 tons, bridge work for Chicago & Northwestern railroad.
4000 tons, car repairs and bridge work for Wabash railroad.
4000 tons, county court house, Camden, N. J.
3500 tons, courthouse and city hall, Camden, N. J.; F. W. Mark Construction Co. low bidder.
3000 tons, building in Seattle for Fisher Body Corp., Detroit.
2500 tons, electrification work, Pennsylvania railroad, Philadelphia to Trenton, N. J.
2000 tons, National Union building, Jackson, Mich. A. Kahn, Detroit, architect. Bids in.
1250 tons, University club, Philadelphia; F. V. Warren low bidder.
1200 tons, industrial school, Scranton, Pa. General contract to Breigs Construction Co.
1000 tons, Boston & Maine railroad hotel, Boston.
1000 tons, warehouse, New York Central railroad, West End avenue, New York.
900 tons, Wise-Smith department store, Hartford, Conn.
800 tons, building, General Motors Corp., Lansing, Mich.
600 tons, building, American Aeronautical Co., Port Washington, Long Island, N. Y.
500 tons, several small bridges for Chicago, Rock Island & Pacific railroad.
325 tons, infirmary, University of California, Berkeley, Calif.; bids received.
300 tons, bridge at Berea road and West 117th street, Cleveland. Bids in.
300 tons, interstate bridge from Niagara, Wis., to Iron Mountain, Mich. Bids close May 3 with village clerk, Niagara.
260 tons, office building addition, Sansome street, San Francisco; bids received.
250 tons, state bridges, Providence, R. I., bids asked.
135 tons, grade crossing, Pacific Electric railroad, Los Angeles. Consolidated Steel Corp. low bidder.
Unstated tonnage, warehouse, Reading Co., Reading, Pa. Foundation Co., New York, is estimating.
Unstated tonnage, shapes and concrete bars for rebuilding Crawford street bridge, Providence, R. I. Bids opened with Roy Beattie, Fall River, Mass., low at $185,240.84.

## Pittsburgh Stays at 95

Pittsburgh, April 16.—Steelmaking facilities in the Pittsburgh district are being operated at 95 per cent, unchanged from recent weeks. Operations of various finishing mills generally are steady, with sheets slightly below 100 per cent due largely to scarcity of semifinished material. Tin plate is up two points at 97 per cent, strip mills continue at capacity, and tubular production holds at 60 per cent for welded pipe and 75 to 90 per cent for seamless products.

The Carnegie Steel Co. will resume operations at its 48-inch universal mill at Farrell, Pa., idle for two years.

## Buffalo at Capacity

Buffalo, April 16.—Operations of all Buffalo steelworks are close to or in excess of 90 per cent. Open-hearth operation is as near capacity as working conditions will permit, with 33 or 34 of the 37 units in the district producing steel from day to day. Some steelworks executives think this month will mark the peak of production and that lower operation may be expected next month.

# Concrete Bars

**Small Jobs Predominate—Few Large Lots Let—Pending Work Aggregate Fair**

NUMEROUS small jobs are being closed up involving concrete bars, with only occasional worth while tonnage, such as the 900-ton plant in Chicago or the 2600-ton warehouse in the East. Prices are not much firmer either in Chicago or Cleveland but in Buffalo, sellers have advanced quotations $2 to $3 a ton. The aggregate of pending work is fairly large.

REINFORCING BAR PRICES, PAGE 1079

**Pittsburgh, April 16.**—Concrete bars are active as regards new inquiries. Sellers are figuring on an increased volume of new work, although much of this is restricted to small tonnages. Specifications to mills are more active and a number of rush orders are being received. The 2.30c, Pittsburgh, price on cut lengths of bars has not been thoroughly tested and the price continues 2.25c to 2.30c, with stock lengths 2.00c to 2.05c.

**Boston, April 16.**—Demand for concrete bars decreased somewhat during the past week, aggregating only about 500 tons. Several prospective jobs are before bidders, including a theater at Salem, Mass., a food product storage building for the First National Stores at Somerville, Mass., a schoolhouse addition at Quincy, Mass., and a bridge in Vermont. An addition to the Young Men's Christian association building at Springfield, Mass., and a junior high school building at West Springfield, Mass., also are in the figuring, but these will not take much concrete bar tonnage being of the welded truss type of constructure. Prices are ruling firm.

**Buffalo, April 16.**—Steelworks have advanced their price on reinforcing bars $2 to $3 a ton. The minimum on lots shipped direct from steelworks is now 2.665c, Buffalo, sellers claim, while on small lots delivered by truck, 2.90c is named. Demand is slow for the season but a large amount of business is scheduled to be placed shortly, the advance in prices having checked a promising buying movement.

**Chicago, April 16.**—Reinforcing bar activity revolves about a large number of small-lot orders in the 25 to 65-ton range. Activity of fabricators is more marked than several weeks ago. They are about 70 to 75 per cent engaged. Fabricated prices are not much firmer. The range for billet bars continues at 2.35c to 2.40c, while rail steel bar quotations are in a range of 2.00c to 2.05c, Chicago.

**Cleveland, April 16.**—Concrete bar activity is spotty. Most jobs let are in the 15 to 50-ton class. Competition is keener than ever, with some local sellers still willing to offer concessions. The Hausman Steel Co., Toledo, O., was awarded three small jobs, aggregating 125 tons. The 140 tons involved in a culvert extension in Garfield Heights, O., went to the H. R. Fishel Steel Co. A bridge at Brookside park is expected to take 400 tons.

## Awards Compared

| | Tons |
|---|---|
| Awards this week | 6,375 |
| Awards last week | 7,365 |
| Awards two weeks ago | 6,823 |
| Awards this week in 1928 | 14,658 |
| Average weekly awards, March | 6,832 |
| Average weekly awards, 1928 | 6,189 |
| Average weekly awards, 1929 | 6,450 |
| Total awards to date, 1928 | 117,796 |
| Total awards to date, 1929 | 103,193 |

## CONTRACTS PLACED

2600 tons, freight warehouse, Pennsylvania railroad, West Philadelphia, Pa.; 1000 tons to Taylor, Davis Inc. and 800 tons each to Concrete Steel Co., and American Steel Engineering Co.
900 tons, plant addition Olson Rug Co., Crawford avenue and Diversey parkway, Chicago, in addition to previous tonnage, to American System of Reinforcing.
600 tons, highway construction jobs in Arkansas, Laclede Steel Co., St. Louis.
300 tons, plant, Heekin Can Co., Norwood, O., to McClintic-Marshall Co., through Ferro Concrete Construction Co.
275 tons, Veterans' hospital, Maywood, Ill., to Jos. T. Ryerson & Son Inc.
275 tons, state highway viaduct, Jersey City, N. J., to Igoe Bros., through Charles Kavanagh, general contractor.
220 tons, apartment, Ninth and Serrano streets, Los Angeles, to unstated interest.
215 tons, apartment, West Seventy-first place, Chicago, to Inland Steel Co.
175 tons, memorial hospital, Fifty-ninth street and Drexel boulevard, Chicago, to Inland Steel Co.
150 tons, plant, Crosley Radio Corp., Cincinnati, to Fort Pitt Bridge Works, through Ferro Concrete Construction Co.
140 tons, Henry street culvert extension, Whitehouse crossing, Garfield Heights, Cleveland, to H. R. Fishel Steel Co., through Pietro Digioia, Cleveland, general contractor.
140 tons, building for Union News Co., Clinton and Forquer streets, Chicago, to Calumet Steel Co.
125 tons, two schools at Carey, O., 75 tons, and theater at Kenton, O., 50 tons, to Hausman Steel Co.
100 tons, Pennsylvania state bridge, Robinson and Moon townships, to Rust Engineering Co.
100 tons, New Jersey state bridge; to Rust Engineering Co.
100 tons, Allegheny County building, Pittsburgh; to Carlem Engineering Co.
100 tons, building for Swift & Co., Chicago, to Concrete Steel Co.

## CONTRACTS PENDING

500 tons, building for Dillingham Transport Co., Honolulu, T. H.; bids received.

500 tons, addition, City-County building, Seattle; bids received.
400 tons, Brookside park bridge, Cleveland, connecting Fulton road and Park drive, to cost approximately $650,000. Tentative plans issued by City Manager Hopkins.
300 tons, building, Reyburn Mfg. Co., Philadelphia.
231 tons, paving in Siskiyou county, Sacramento, Calif.; bids May 8.
215 tons, (mesh), for Hamlin-Brockport road, New York state, Joseph M. Murray, Rochester, N. Y., low bidder.
200 tons, University of Chicago hospital, Chicago.
145 tons, (mesh), for Fairport-Nine Mile Point road, New York state; Francis J. Cadin, Syracuse, N. Y., low bidder.
100 tons, apartment building, 1242 Lake Shore drive, Chicago.
Unstated tonnage, Marshall Field & Co. store building, Evanston, Ill.
Unstated tonnage, concrete bar and structural shapes for rebuilding Crawford street bridge, Providence, R. I. Bids opened, with Roy Beattie, Fall River, Mass., low at $185,240.84.

# Rails, Cars

**Western Car Builders Increase Steel Specifications—Canadian Road Buys 1000 Cars**

RECENT car lettings to western builders have resulted in the stepping up of steel specifications to mills in the Chicago district. Some car builders have enough orders on hand for four or five months. Canadian National railways bought 1000 automobile cars. Baltimore & Ohio is expected soon to close on 3000. Rock Island purchased 25 locomotives.

RAILROAD TRACK PRICES, PAGE 1080

**Chicago, April 16.**—Car building shops have stepped up sharply their specifications to the mills for bars, plates and shapes, but they have not yet reached their peak in this district. Union Pacific asks bids on 500 automobile cars and Northern Pacific awarded 500 against its recent inquiry for 1300 freight cars. This leaves but 200 flats and 100 stock cars to be placed. A portion of the 3000 cars to be placed by the Baltimore & Ohio is expected to go to western builders.

About 5000 tons of secondary rail business, purchased recently, has just been entered on the books of western mills. Track fastening sales totaled 3000 to 4000 tons for the week. Specifications are at an unusually high rate for track fastenings. Those departments are engaged at capacity.

**New York, April 16.**—While the car market continues active with substantial lists pending, little fresh inquiry or buying is reported. Locomotive activity is topped by an order for 25 for Chicago, Rock Island & Pacific.

**Pittsburgh, April 16.**—Producers of railroad spikes and tie plates receive steady specifications to apply against old orders. Current demand is expected to be maintained well into May. Buying for replacement is light in comparison with material for new construction. Operations of standard rail mills are steady. Light rail demand, however, is meager. New business for fastenings is lacking.

## CAR ORDERS PLACED

Baltimore & Ohio, five diners to Pullman Car & Mfg. Corp.
Canadian National, 1000 freight cars, to Pressed Steel Car Co.
Cincinnati, Hamilton & Dayton, six Hart convertible ballast cars, to American Car & Foundry Co.
Erie, 10 steel baggage and express cars, to Pullman Car & Mfg. Corp.
Great Northern, one gasoline-electric rail motor car, to St. Louis Car Co.
National Railways of Mexico, 15 narrow gage and 10 standard gage passenger cars, to Pullman Car & Mfg. Corp.
New Cornelia Copper Co., 50 dump cars, to Koppel Industrial Car & Equipment Co.
Northern Pacific, 500 all-steel automobile cars, to Pacific Car & Foundry Co.

### LOCOMOTIVE ORDERS PLACED

Chicago, Rock Island & Pacific, 25 locomotives, to American Locomotive Co.

## CAR ORDERS PENDING

Chicago & Eastern Illinois, two mail and smoking cars.
New York, New Haven & Hartford, 40 to 50 70-ton dump cars.
Nickel Plate, 13 miscellaneous coaches.
Pittsburgh Steel Co. seven 50-ton flat cars.
Southern Pacific, 15 chair cars.
Union Pacific, 500 all-steel automobile cars.

## Alloy Steel

**Mills Unable to Take More Business For Early Shipment—2.65c Quoted**

**Detroit, April 16.**—Producers of alloy steel continue to turn away business because they cannot accept additional volume for prompt delivery. First quarter shipments into this district were a record. April shipments to date have been at the March rate and an unusual second quarter is in the making. Many users have been making supplemental purchases. Though some material is moving into this district at slightly lower prices, the mill base of 2.65c for alloy quality bars is generally quoted.

## Merger Talk Is Revived

Cleveland, April 16.—Reports that a merger of Youngstown Sheet & Tube Co., Inland Steel Co. and Republic Iron & Steel Co. again is under consideration received impetus today following a meeting here of interests identified with these companies. Sponsorship of the move is attributed to Cyrus Eaton and associates, of Cleveland, who are understood to be acquiring a large inetrest in the Bourne-Fuller Co., Cleveland. A merger of these independent interests would result in a steel producing unit third only to the United States Steel Corp. and Bethlehem Steel Co. About a year ago a projected amalgamation of the Youngstown and Inland companies fell through.

## Two Receivers Named

Homer W. Bleckley, Worcester, Mass., and Jerome C. Smith, Boston, were appointed receivers for Stevens Walden-Worcester Inc., Worcester, Mass., by federal court, April 9.

Blast furnace of the Union Steel Corp. of South Africa Ltd., Newcastle, Natal, was lighted last Oct. 17 and in the remainder of 1928 produced 9984 tons of pig iron. This is the only furnace producing pig iron in commercial quantities in Africa.

## Call Business Meeting

New York, April 16.—The annual business meeting of the American Iron and Steel institute has been called for May 6. This is not to be confused with the semiannual general meeting scheduled for May 24.

Amendments to the by-laws, adopted since the last annual meeting, will be considered. One amendment limits active membership to 2000 and associate to 800. Another realigns standing committees to include one on membership of five members; improvement in methods, five; foreign relations, three; statistics, three; welfare work, five; arrangements, five; finance, three; and tariff, eight.

## Standard Gets Approval

A subcommittee of the American Standards association has approved a proposed American standard for steel companion flanges for maximum working steam pressures of 250, 400, 600, and 900 pounds per square inch (gage) at 750 degrees Fahr. The draft now is being circulated for criticism. Over the subcommittee is the general sectional committee on pipe flanges and fittings of which the American Society of Mechanical Engineers, Heating and Piping Contractors' National association and Manufacturers' Standardization Society of the Valve and Fittings Industry, are sponsors. Copies of the proposed standard will be loaned on request.

A proposed American standard for woodruff keys, keyslots and cutters is being circulated for general criticism prior to its submission to the general sectional committee of the American Standards association on shafting. The American Society of Mechanical Engineers is sponsor. Copies are available for review.

# The Market Section

## Wire

**Nails Fail to Gain Volume but Manufacturers' Wire Is in Active Demand—Mill Rates Hold**

WIRE to be converted into a wide variety of articles is in excellent demand, which is holding up well. Nails continue in slow demand and makers have no more orders than can be shipped in April. In general the wire market is brisker than a month ago. Prices are holding their position and show no weakness. Producers are operating mills at about the same rate.

WIRE PRICES, PAGE 1080

**Chicago, April 16.**—Moderate gains are being made in sales of agricultural wire products. Woven fencing is picking up slowly. Jobbers in the central states are more encouraged than for many months. Manufacturers' and merchants' wire is holding its own and production and shipments are expected to be near those of March. Wire mill operations have not been increased appreciably and stand at about 70 per cent. Prices for wire products are reported steady on the basis of 2.55c, Chicago or western mills for bright plain wire, and $2.70 for wire nails to large jobbers.

**Worcester, Mass., April 16.**—Specifications against second quarter wire contracts are resulting in heavier shipments from New England mills and drawing schedules have been increased slightly in some instances. Demand is well spread and prices are firm on a basis of 2.75c, Worcester base, to dealers.

**New York, April 16.**—Demand for plain steel wire for manufacturing purposes continues brisk. The market is firm at 2.50c, base, Pittsburgh. Demand for wire nails, however, shows little vitality and current requirements are being met largely out of stocks laid in against first quarter contracts. There has not been a great deal of buying at the new $2.75, base, Pittsburgh, price.

**Pittsburgh, April 16.**—Continued steady demand for manufacturers' wire and a slow market for wire nails feature wire product buying. Total business, however, shows a slight improvement compared with a month ago. Demand from automotive interests for manufacturers' wire is holding well to the March and early April rates. Wire fencing sales gradually are expanding with northern buyers taking more material. The cut nail market is quiet, business lagging substantially behind the rate of a year ago.

**Cleveland, April 16.**—Plain wire specifications are fairly liberal. Nails are growing more active although most nail business, especially from jobbers, is either shipped or on the books for shipment this month. Full prices are being received.

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Wm. H. Muller & Co. and the Iron & Ore Corp. of America are now located in the Chanin building at 122 East Forty-second street, New York.

## Cold Finished Steel

**Buying Is Slackened But Producers Have Backlogs**

COLD FINISHED PRICES, PAGE 1080

**Pittsburgh, April 16.**—Buying of cold finished steel bars is less active than late in first quarter when consumers were closing out contracts, but producers have comfortable backlogs which are being decreased at a slow rate. A fair volume of specifications, however, has been received against second quarter contracts at 2.30c, Pittsburgh, an advance of $2 a ton over first quarter. There are no definite signs of marked decrease in automotive operations although the normal slackening in new buying this month makes it difficult to ascertain definitely the trend in automotive requirements.

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## Chicago Rate Unchanged

Chicago, April 16.—Steelworks operations, which have been continuing at about 98 per cent since early in the first quarter, are unchanged in this district. It is indicated this rate may not show any immediate decline unless furnaces and equipment, which have been under a heavy strain for several months, should need repairs. Some extensive open-hearth repairs may be necessary shortly. Of the 36 steelworks furnaces in the district, 29 are blowing. The leading interest has 20 of its 27 furnaces active.

## Strip

**Consumers Find Delivery Most Important Factor—Demand Continues Heavy and Prices Firm**

DELIVERY continues the most important feature of the strip steel market. In some producing districts mills are able to give slightly better delivery but in others congestion is increasing. Three to seven weeks represents the spread in mill service. Prices are unchanged. A Milwaukee automobile frame maker will ship strip by boat from Chicago.

STRIP PRICES, PAGE 1080

**Pittsburgh, April 16.**—Buying of strip steel is proceeding at a slower pace, following the abnormal demand of March, when contracts were being closed out. This is only a normal trend, however, and specifications are relatively heavy. High operations have permitted mills to decrease recent heavy backlogs slightly and deliveries have been improved somewhat. On narrow sizes of hot strip six to seven weeks represents maximum delivery time, compared with eight weeks a short time ago. Cold strip shipments vary from three to five weeks, also a slight improvement. Operations continue at capacity, although some rolling schedules are restricted by congestion in other departments. Current prices of 1.90c to 2.00c, Pittsburgh, for two sizes of hot strip, and 2.75c to 2.85c for cold strip, are well maintained.

**Worcester, Mass., April 16.**—Demand for cold rolled strip continues steady at firm prices, 3.10c and 3.20c, Worcester base, three tons or over. A fair total of odd shipments under that weight are commanding premium prices. Buying is well spread and in some instances New England uses of strip apparently failed to anticipate fully needs for current quarter.

**Cleveland, April 16.**—One or two nearby strip mills can still make early May delivery of hot rolled but others cannot ship before late May or early June. Cold strip deliveries are four to six weeks deferred. Specifications exceed shipments and unfilled tonnage is increasing. From 1.90c to 2.00c, Pittsburgh, continues the quotable market on hot, with $2 per ton additional on specifications up to five tons of a size. The cold price is unchanged but firm at 2.75c to 2.85c, Cleveland-Pittsburgh, with nothing said as yet as to third quarter.

**Chicago, April 16.**—Cold rolled strip steel deliveries have been notably extended, but the situation is not acute and some relief is being found. Shipments average five to six weeks. A maker of automotive frames in the Milwaukee district will require about 30,000 tons of hot-rolled strip steel this month. It is understood at least a part of this will be shipped by boat from the Chicago district. Cold rolled strip is quoted at 2.75c to 2.85c, Pittsburgh-Cleveland, for lots of 3 tons and over.

# Nonferrous Metals

**Break in Copper Contributes to Demoralization in Other Markets—Users Well Covered on Spring Needs**

## Prices of the Week, Cents a Pound

| | Copper | | | Straits Tin | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Electro delivered | Lake delivered | Casting refinery | New York Spot | New York Futures | Lead New York | Lead East St. Louis | Zinc St. Louis | 98-99% Aluminum | Spot Antimony | Ingot Nickel |
| Apr. 10 | 19.50 | nominal | 19.25 | 46.40 | 46.46 | 7.15 | 7.00 | 6.70 | 23.90 | 9.62½ | 35.00 |
| Apr. 11 | 19.25 | nominal | 19.00 | 46.75 | 46.75 | 7.15 | 7.00 | 6.70 | 23.90 | 9.62½ | 35.00 |
| Apr. 12 | 19.25 | nominal | 19.00 | 46.00 | 46.00 | 7.15 | 7.00 | 6.75 | 23.90 | 9.50 | 35.00 |
| Apr. 15 | 18.50 | nominal | 18.00 | 45.25 | 45.25 | 7.00 | 6.85 | 6.62½ | 23.90 | 9.55 | 35.00 |
| Apr. 16 | 18.00 | nominal | 17.50 | 45.62½ | 45.62½ | 7.00 | 6.85 | 6.62½ | 23.90 | 9.55 | 35.00 |

NEW YORK, April 16.—Nonferrous metal markets have become demoralized, largely on account of the break in copper. Other factors have entered, such as the weak stock market, the money situation, and previous rapid rises in all metals. Speculative market conditions abroad have had an influence. One reason for recent strength here was the possibility of cut-off supplies from Mexico, but now conditions have improved in that country. It also is said that Germany is holding back her purchases abroad on account of the reparations situation.

Users of metal are well covered for their spring needs, with the result that they are not induced to buy more even at cut prices. Current lower prices on copper and lead still are far above the averages of the past few years.

Brass and copper mill product prices have been withdrawn from the basis of 24-cent copper but no new base prices have been issued. It is understood that until the copper market becomes more settled, mills will quote against each inquiry as it arises, according to their best information on the copper market at the time.

Shipments and use of all metals continues unusually large. The price situation became unsound because of its rapid rise so the truth about consumption is obscured for the time being. There is danger of the drop being overdone, just as the rise was overdone. In other words, there is a possibility of rapid fluctuation in both directions, say prominent buyers and sellers, before equilibrium is reached.

**Copper**—After the break from 24.00c, Connecticut, beginning April 8, the market appeared to settle at 19.25c, but on Monday the lack of buying caused it to drop in the afternoon to 18.50c and then before the close to 18.00c. Not much metal was sold at any price except for a fair amount, mostly August shipment, at 19.25c. Statistics for March showed shipments breaking all records, nearly 166,000 tons. Stocks were cut about 2200 tons to less than 53,000 tons of refined metal. Output also broke all records. April shipments undoubtedly will be far above average but output may be a shade over them, it is said.

**Tin**—The price of Straits fell to 45.25c, perhaps a shade less on a few sales, the lowest in several years. This was a little under the price of last June when there was a stir in the market because the prediction that tin would drop to 45.00c was considered extreme. Consumers did good buying around 46.00c, mostly for nearby positions, but speculative support was withdrawn. The latter factor has been prominent in the market in London in the past year even though speculative business in this country has been light.

**Zinc**—Prime western has held better than most other metals, but the recent high price of 6.80c, East St. Louis, has become merely an asking price, with some odd lots available in the past few days as low as 6.60c. Even the latter has not been taken to any great extent.

**Lead**—After the market had shown signs of holding at 7.15c, New York, it gave way Monday afternoon to 7.00c. Not much buying has been done lately. The recent high was 7.75c. That was an artificial level, caused by the uncertain transportation situation in Mexico and a sudden spurt abroad.—*Daily Metal Trade.*

## Mill Products

**Base prices cents per pound f.o.b. mill, except where otherwise specified**

All copper and brass product prices have been temporarily withdrawn. Nickel silver and phosphor bronze are included.

**SHEETS**

| | |
|---|---|
| Lead, full sheets (cut ¼c more) | 10.00 |
| Zinc sheet (100-pound base) | $10.25 |
| Zinc strip (10-pound base) | $9.25 |
| Aluminum, flat sheets, up to 10 gage, 3" to 72" wide | 31.30 |

## Old Metals

**Dealers' buying prices, cents per pound**

| | |
|---|---|
| **HEAVY RED BRASS** | |
| New York | 12.50 to 13.00 |
| Chicago | 12.50—nominal |
| Cleveland | 12.00 to 12.50 |
| **HEAVY YELLOW BRASS** | |
| Cleveland | 8.50 to 9.00 |
| **ZINC** | |
| New York | 3.50 to 3.75 |
| Cleveland | 3.25 to 3.50 |
| **HEAVY COPPER AND WIRE** | |
| New York | 14.50 to 15.00 |
| Boston | 14.00 to 14.50 |
| Chicago | 13.50—nominal |
| Cleveland | 14.00 to 14.25 |
| **RED BRASS BORINGS** | |
| New York | 11.50 to 12.00 |
| **YELLOW BRASS TUBING** | |
| Cleveland | 8.50 to 9.00 |
| **LIGHT COPPER** | |
| New York | 13.00 to 13.50 |
| Chicago | 12.50—nominal |
| Cleveland | 12.50 to 13.00 |
| **LIGHT BRASS** | |
| Boston | 8.00 to 8.50 |
| Chicago | 8.50—nominal |
| Cleveland | 6.00 to 6.25 |
| **ALUMINUM** | |
| Clippings, Cleveland | 18.00 to 18.50 |
| Borings, Cleveland | 9.50 to 10.00 |
| Cast Cleveland | 12.75 to 13.00 |
| Cast, Boston | 10.50 to 11.00 |

## Secondary Metals

| | |
|---|---|
| Remelt aluminum No. 12 | 17.00 to 17.50 |
| Brass ingot, 85-5-5-5 | 17.00 to 18.00 |

## Coke By-Products

**Benzol Price Weathers Large Production—Naphthalene Buying**

New York, April 16.—Notwithstanding substantial production of benzols, the market is unchanged. Steadiness also prevails in other light oil distillates.

Substantial buying is noted in naphthalene, although business is largely of "fill-in" character, with the drug trade placing orders to round out its spring cleaning season contracts. Flakes and balls are quoted firmly.

Specifications against long time contracts for sulphate of ammonia continue to come out freely, although the season should be nearing a close with another fortnight or so. Meanwhile, sulphate for domestic account continues $2.30, delivered, and for export $2.20, port, in double bags.

## Coke Oven By-Products

**Per Gallon at Producers' Plant in Tank Lots**

| | Spot |
|---|---|
| **Pure Benzol** | **$0.23** |
| 90 per cent benzol | 0.23 |
| Toluol | 0.40 |
| Solvent naphtha | 0.30 |
| Commercial xylol | 0.30 |
| **Per Pound at Producers' Plants in 250-Pound Drums** | |
| Phenol | 0.17 |
| **Per Pound at Producers' Plants** | |
| Naphthalene flakes | 0.05½ to 0.06½ |
| **Naphthalene balls** | **0.06½ to 0.07½** |
| **Per 100 Pounds Delivered** | |
| Sulphate of ammonia | $2.30 |

Ferro Machine & Foundry Co., Cleveland, is installing two additional molding conveyors at its No. 2 plant. This will give it a total of 13 conveyors at both plants for the production of automobile parts.

# Warehouse

**Jobber Sales Generally Exceed March Rate —April Movement Large in East—Prices Firm Except Galvanized Sheets**

DISAPPOINTING in some sections, warehouse trading generally holds up due to inability of mills to make required deliveries. Many customers are depending upon jobbers to aid them in bridging the gaps until mill shipments catch up. Prices generally are firm except in galvanized sheets, which are weak in the East and Cleveland.

**Philadelphia** — Warehouse demand continues good with prices unchanged, although jobbers report that competition from foreign steel again is unusually keen.

**New York**—Trading in the local warehouse market is maintained at the improved rate of the past three or four weeks. Most leading jobbers, however, assert there still is room for improvement and that the local jobbing situation is not comparable with the high rate of mill activity. At the present rate, April should be the best month so far this year. Prices are unchanged, with weakness in galvanized sheets.

**Buffalo**—Warehouse sales of iron and steel continue to hold the gain over the like period of 1928 which has now been noted for several months. Demand for sheets and structural shapes is especially good. Warehouse operators anticipate a good second quarter.

**Detroit**—Sales are averaging higher than a year ago but warehouses have not benefited to the extent expected from deferred mill deliveries. Structural material is not moving as rapidly as usual at this season. Bars and sheets are in good demand. Prices are unchanged but steady.

**Cleveland**—With average mill deliveries continuing to slow up, with little if anything available this side of three weeks, warehouses are benefiting accordingly. With some the buying rate is equal to March, the record-breaking month in a long period and while for others, the demand is slightly under March, it still is diversified as ever. Prices on everything except black and galvanized sheets are firm.

**Cincinnati**—Mill backlogs are helping to fill warehouse order books. Business in this area is reported to be better this week than last. Prices continue at unchanged levels. Cooler weather has slowed down outside work.

**St. Louis**—Extended deliveries by mills are redounding to the benefit of warehouses in this district. They report an increased volume of orders for filling in purposes from interests that usually purchase sheets, plates, bars and rolled goods from mills.

## Warehouse Quotations in Cents Per Pound at Leading Market Centers

### STEEL BARS

| | |
|---|---|
| Baltimore | 3.10c |
| Boston | 3.265c |
| Buffalo | 3.30c |
| Chicago | 3.00c |
| Cincinnati | 3.30c |
| Cleveland | 3.00c |
| Detroit | 3.00c |
| Ft. Worth | 3.75c |
| Houston | 3.00c |
| Los Angeles | 3.30c |
| New York††‡‡ | 3.25c |
| Philadelphia* | 2.80c |
| Pittsburgh | 2.90c |
| Portland | 3.00c |
| San Francisco | 3.15c |
| Seattle | 3.00c |
| St. Louis | 3.15c |
| St. Paul | 3.25c |
| Tulsa | 3.75c to 4.04c |

### IRON BARS

| | |
|---|---|
| Baltimore | 3.10c |
| Boston | 3.265c |
| Buffalo | 3.30c |
| Chicago | 3.00c |
| Cincinnati | 3.30c |
| Detroit | 3.00c |
| Ft. Worth | 3.75c |
| New York†† | 2.80c to 3.24c |
| Philadelphia* | 2.80c |
| St. Louis | 3.15c |
| Tulsa | 3.75c to 4.04c |

### REINFORCING BARS

| | |
|---|---|
| Baltimore | 3.31c |
| Boston | 3.265c to 3.50c |
| Buffalo | 2.90c |
| Cincinnati | 3.15c |
| Cleveland | 2.25c to 2.44c |
| Detroit | 2.80c to 3.00c |
| Ft. Worth | 3.50c |
| Houston | 3.00c |
| Los Angeles cl. | 2.65c |
| Los Angeles lcl. | 3.00c |
| New York | 2.90c to 3.30c |
| Philadelphia | 2.75c to 3.10c |
| Pittsburgh | 2.90c to 3.175c |
| San Francisco cl. | 2.00c |
| San Francisco lcl. | 2.25c |
| Seattle | 3.00c |
| St. Louis | 3.15c |
| Tulsa | 3.75c to 4.00c |
| Youngstown | 2.30c to 2.60c |

### STRUCTURAL SHAPES

| | |
|---|---|
| Baltimore | 3.10c |
| Boston | 3.365c |
| Buffalo | 3.40c |
| Chicago | 3.10c |
| Cincinnati | 3.40c |
| Cleveland | 3.00c |
| Detroit | 3.10c |
| Ft. Worth | 4.00c |
| Houston | 3.25c |
| Los Angeles | 3.30c |
| New York†††‡‡ | 3.25c to 3.30c |
| Philadelphia* | 2.70c |
| Pittsburgh | 3.00c |
| Portland | 3.00c |
| San Francisco | 3.15c |
| Seattle | 3.00c |
| St. Louis | 3.25c |
| St. Paul | 3.35c |
| Tulsa | 3.75c to 4.14c |

### PLATES

| | |
|---|---|
| Baltimore | 3.10c |
| Boston | 3.365c |
| Buffalo | 3.40c |
| Chicago | 3.10c |
| Cincinnati | 3.40c |
| Cleveland, ¼-in. and thicker | 3.00c |
| Cleve., 3/16-in. | 3.20c |
| Detroit | 3.10c |
| Detroit, 3/16-in. | 3.30c |
| Ft. Worth | 4.00c |
| Houston | 3.00c |
| Los Angeles | 3.30c |
| New York‡‡ | 3.30c |
| Philadelphia* | 2.70c |
| Phila., 3/16-in.* | 2.90c |
| Pittsburgh | 3.00c |
| Portland | 3.00c |
| San Francisco | 3.15c |
| Seattle | 3.00c |
| St. Louis | 3.25c |
| St. Paul | 3.35c |
| Tulsa | 3.75c to 4.14c |

### NO. 10 BLUE ANNEALED

| | |
|---|---|
| Baltimore | 3.45c |
| Boston ⅛-in. | 3.915c |
| Buffalo | 3.50c |
| Chicago | 3.35c |
| Cincinnati | 3.45c |
| Cleveland | 3.25c |
| Detroit | 3.35c |
| Ft. Worth | 4.50c |
| Houston | 3.90c |
| Los Angeles | 4.00c |
| New York‡‡ | 3.90c |
| Portland | 3.75c |
| Philadelphia*† | 3.25c |
| Pittsburgh** | 3.35c to 3.45c |
| San Francisco | 3.80c |
| Seattle | 4.00c |
| St. Louis | 3.45c |
| St. Paul | 3.75c |
| Tulsa | 4.20c to 4.34c |

### NO. 24 BLACK SHEETS

| | |
|---|---|
| Baltimore | 3.25c to 4.00c |
| Boston | 4.85c |
| Buffalo | 4.20c |
| Chicago | 3.80c |
| Cincinnati | 3.90c |
| Cleveland | 3.60c to 3.70c |
| Detroit | 3.95c |
| Ft. Worth | 4.70c |
| Los Angeles | 4.90c |
| New York | 3.90c to 4.00c |
| Philadelphia*† | 4.10c |
| Pittsburgh** | 3.85c |
| Portland | 4.90c |
| San Francisco | 4.90c |
| Seattle | 5.00c |
| St. Louis | 4.25c |
| St. Paul | 3.95c |
| Tulsa | 4.34c |

### NO. 24 GALVANIZED SHEETS

| | |
|---|---|
| Baltimore | 4.30c to 4.50c |
| Boston | 5.60c |
| Buffalo | 4.70c to 4.85c |
| Chicago | 4.65c |
| Cincinnati | 4.75c |
| Cleveland | 4.35c to 4.55c |
| Detroit | 4.75c |
| Ft. Worth | 5.50c |
| Houston | 5.30c |
| Los Angeles | 5.30c |
| New York | 4.75c |
| Philadelphia*† | 4.85c |
| Pittsburgh** | 4.85c to 4.95c |
| Portland | 5.50c |
| San Francisco | 5.30c |
| Seattle | 5.50c |
| St. Louis | 5.10c |
| St. Paul | 4.90c |
| Tulsa | 5.10c to 5.35c |

### BANDS

| | |
|---|---|
| Baltimore | 3.85c |
| Boston | 4.015c to 5.00c |
| Buffalo | 3.65c |
| Chicago | 3.20c |
| Cincinnati | 3.50c |
| Cleveland | 3.25c to 3.65c |
| Detroit, ⅛-in. and lighter | 3.30c |
| Ft. Worth | 4.25c |
| Houston | 3.65c |
| Los Angeles | 4.15c |
| New York‡‡ | 3.75c |
| Philadelphia* | 3.15c |
| Pittsburgh | 3.25c |
| Portland | 4.00c |
| San Francisco | 3.75c |
| Seattle | 4.00c |
| St. Paul | 3.50c |
| Tulsa | 4.50c to 4.69c |

### HOOPS

| | |
|---|---|
| Baltimore | 4.00c |
| Boston | 5.50c to 6.00c |
| Buffalo | 4.05c |
| Chicago | 3.75c |
| Cincinnati | 4.05c |
| Cleveland | 3.25c to 3.65c |
| Detroit, No. 14 and lighter | 3.80c |
| New York‡‡ | 4.25c |
| Philadelphia* | 3.40c |
| Pittsburgh | 4.25c |
| Seattle | 5.00c |
| St. Paul | 4.00c |

### COLD FINISHED STEEL

| | Rounds, hexagons, | Flats, squares |
|---|---|---|
| Baltimore (c) | 3.35c | 3.85c |
| Boston | 3.55c | 4.05c |
| Buffalo | 3.95c | 4.45c |
| Chicago | 3.60c | 4.10c |
| Cincinnati | 3.85c | 4.35c |
| Cleveland | 3.65c | 4.15c |
| Detroit | 3.85c | 4.35c |
| Los Angeles (a) | 4.50c | ..... |
| New York | 3.60c | 4.10c |
| Philadelphia* | 3.60c | 4.00c |
| Pittsburgh | 3.70c | 4.20c |
| Portland (a) | 4.50c | ..... |
| San Fran. (a) | 4.25c | ..... |
| Seattle (a) | 5.00c | ..... |
| St. Paul (a) | 3.85c | ..... |
| Tulsa | 4.64c | 5.14c |

(a) Rounds only.

### COLD ROLLED STRIP

| | |
|---|---|
| Boston, 0.100-inch, 500 pound lots | 5.30c |
| Buffalo | 5.85c |
| Chicago (b) | 6.10c |
| Cincinnati | 7.15c |
| Cleveland (b) | 5.95c |
| Detroit | 5.80c |
| New York | 5.15c |
| Philadelphia (c) | 5.15c |

(b) Net base, straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.

### SWEDISH IRON AND STEEL

New York duty paid

| | |
|---|---|
| Hollow drill steel | 13.00c |
| Iron bars, round | 6.10c |
| Iron bars, flats and squares | 6.50c |

*Plus quantity differentials. ‡‡Minus quantity differentials. ††Domestic bars. **Less than 25 sheets. *†50 or more bundles.

# Pacific Coast

**Demand Lighter in Some Lines—Much New Business Appears—Prices Firm**

AFTER the activity of several weeks in all lines requiring iron and steel products, some slackening of demand has taken place on the coast. Prices are not affected and new projects are appearing in sufficient volume to indicate steady though reduced buying. A new railroad into the Olympic peninsula promises activity in logging, which will stimulate steel demand.

**San Francisco, April 13.**—(*By Air Mail*)—Demand for iron and steel products on the Pacific coast has eased somewhat, especially in cast iron pipe and plate material. Important bookings include 16 locomotives, 10 lounge and 3 observation cars for the Southern Pacific. The price structure is on a firmer basis, although plates are not as firm as other commodities.

Foreign importations of iron and steel products on the Pacific coast for January, figures for which have just been received, were as follows for the major items:

| | Tons | | |
|---|---|---|---|
| | Jan., 1929 | Dec., 1928 | Jan., 1928 |
| Coke | 3,739 | 4,442 | 4,751 |
| Cast iron pipe | 1,783 | 2,991 | 1,823 |
| Tubular products | 944 | 3,846 | 1,089 |

### Pig Iron and Coke

Movement of foundry pig iron and coke continues limited, most consumers having sufficient stocks for present requirements. As a result, sales and inquiries are confined to unimportant lots. Prices are unchanged.

## Coast Pig Iron Prices

| | |
|---|---|
| Utah basic | $25.00 to 26.00 |
| Utah foundry | 25.00 to 26.00 |
| *German | 24.25 |
| *Indian | 24.00 to 25.00 |

*C.i.f. duty paid.

### Bars, Plates and Shapes

Awards of concrete bars this week were the smallest in over six weeks and totaled less than 400 tons. An apartment in Los Angeles, involving 220 tons, was the only award reported in excess of 100 tons. Pending business involves a fair tonnage and includes 500 tons for buildings in Honolulu. Out-of-stock prices have become much firmer and 2.30c, base, appears firm on carload lots with 2.20c applying on 250 ton lots. On less than carload lots 2.60c is firm, both in the Los Angeles and San Francisco districts.

Bids were opened this week on 240 tons for 4 to 16-inch riveted or welded steel pipe for Sierra Madre, Calif. This is the only project involving more than 100 tons up for figures at present. A siphon at Ellensburg, Wash., bids on which were opened last month and which called for close to 1700 tons, went reinforced concrete. So far this year 56,891 tons have been awarded, compared with 11,022 tons for the same period a year ago. While 2.35c c.i.f. Coast ports, continues the usual quotation, this figure can by no means be considered firm as little real tonnage has come out to test the price.

Structural shape awards during the week aggregated 1227 tons and brought the total for the year to 59,668 tons, compared with 51,813 tons for the corresponding period in 1928. The three largest awards called for 200 tons for an apartment in San Francisco, 250 tons for airport buildings at Alhambra, Calif., and 175 tons for an overhead crossing in Los Angeles for the Pacific Electric Co. Bids were opened this week on 300 tons for an infirmary in Berkeley for the University of California and 260 tons for an office building in San Francisco. Prices on plain material are firm at 2.35c c.i.f.

### Other Finished Material

The Southern Pacific, San Francisco, opened bids this week on 500 tons of track bolts and 2350 tons of track spikes. This company has awarded 16 locomotives to the Baldwin Locomotive Works and 3 observation and 10 lounge cars to the Pullman Car & Mfg. Corp. It also took bids this week on 21 gas and electric cars.

Cast iron pipe sales have fallen off and this week totaled less than 750 tons. The largest letting was taken by the United States Cast Iron Pipe & Foundry Co. and involved 309 tons for Sacramento, Calif. San Diego placed 359 tons for two street improvement projects with George R. Daley. The largest pending tonnage involves 819 tons for Sierra Madre, and alternate bids on riveted or welded steel pipe were also received.

## New Railroad at Seattle

**Seattle, April 10.**—Announcement that the Northern Pacific and Oregon-Washington Railroad & Navigation Co., a subsidiary of the Union Pacific, will build a 61-mile branch line, with six miles of siding in Grays Harbor and Jefferson counties, Washington, is of far reaching importance signifying the opening of the Olympic Peninsula, on which is the largest remaining stand of virgin timber in the United States. Permission for this work has been granted by the interstate commerce commission. The extension will run from Aloha to the Hoh river. This construction will forestall efforts of Grays Harbor people to obtain legislative permission to build a publicly owned railroad line into the new territory.

The outlook for the iron and steel trades is promising as several large projects are either being figured or are to be up soon. Prices are holding firm.

### Pig Iron and Coke

Foundrymen report general activity with sawmill, cannery and marine repair work in full swing. Plants are busy and conditions generally quite satisfactory. Material prices are unchanged. Burn iron at $25.75 and No. 1 Columbia at $27 are the ruling quotations although some local buyers are protected under contract on Columbia at $26. Coke prices are unchanged at $13.25 and $13.50 for the two leading British grades and is being purchased in quantities as required.

### Bars, Plates and Shapes

Local steel mills are operating steadily, there being much new business in car lots. Specifications are being received for many projects requiring fairly heavy tonnages and while no contracts of more than 100 tons have been closed this week, considerable tonnage is about to be placed. Mill prices of bars are unchanged at 2.35c, reinforcing at 2.20c.

Puget Sound Machinery Depot is building a boiler for the Snoqualmie Falls Lumber Co., requiring about 175 tons of plates. Mill prices are firm at 2.35c but no large tonnages are immediately pending. General Petroleum Co. announces it will construct a subsidiary terminal oil plant on the Lake Washington Canal, Seattle, at a cost of $100,000.

No contracts involving more than 100 tons of shapes were placed this week but some new business has developed. Seattle city council has authorized the Garfield street bridge, involving 1000 tons of structurals, 160 tons are needed for the addition to the county-city building, and 200 tons in a proposed telephone building at Salem, Oreg. Bids will be opened in Tacoma next month for the Eleventh street viaduct, requiring 2000 tons. Isaacson Iron Works, Seattle, has closed for 42 tons of shapes for a warehouse at Ketchikan, Alaska, for the W. B. Foshay Co. Mill prices of structurals are unchanged and firm at 2.35c.

### Finished Materials

The wholesale jobbing business is better than at same time last year and is reported quite satisfactory. There is activity in demand but mill business is quiet. Price schedules are unchanged and there is less complaint about cutting and the competition of foreign materials. Plates are moving slowly under the higher mill levels, jobbers having accumulated fairly large stocks at the lower prices prevailing during first quarter.

Inquiry for cast iron pipe continues active, especially in British Columbia. American Cast Iron Pipe Co. has closed a contract with Edmonton, Alta., for 300 tons.

## Steel Furniture Makers Submit Code

Washington, April 16.—Representatives of 85 per cent of the steel furniture manufacturing industry held a trade practice conference here April 13.

Edgar A. McCullough, chairman of the federal trade commission, presided, and A. F. Myers, former member of the commission, acted as attorney for the manufacturers.

A code consisting of 16 paragraphs had been adopted by the National Association of Steel Furniture Manufacturers prior to the Saturday meeting, and this was confirmed at the conference. The code now goes to the commission for its action. Of the 38 steel furniture manufacturers of the country, 30 were represented.

One of the principal topics taken up at the conference was that of price discrimination, said to be an outstanding evil of the steel furniture industry. It was contended by speakers that this practice is being carried on in the industry in violation of the policy, if not the letter, of section 2 of the Clayton act as interpreted by the Supreme Court's recent decision in the American Can Co. case.

Other matters discussed included rebates, commercial bribery, interference with contracts, enticement of employes, misleading statements, guarantee against price decline, uniform contracts, and similar questions.

## Makers of Oil Burners Meet in New York

The use of oil as a heating agent was discussed at length at the annual meeting of the American Oil Burner association, held at Hotel Pennsylvania, New York, April 8-11. Attendance was more than 1000. A feature of the convention was an exhibition of oil heating apparatus and accessories with about 100 manufacturers represented.

According to J. C. Johnson, president, S. T. Johnson & Co., Oakland, Calif., and retiring president of the association, the oil heating industry has grown into a $100,000,000 giant during the past five years. More than 600 companies in America manufacture oil burners. It is estimated by the oil heating institute that 24,000,000 barrels of fuel and furnace oil will be consumed in 1929 by the 423,000 burners in operation. Oil heat in large buildings and in manufacturing plants has made rapid progress during the last year.

E. M. Fleishmann, president, May Oil Burner Corp., Baltimore, was elected president of the association for the coming year. Following a reorganization of the Oil Heating institute, Haldeman Finnie, vice president and general manager, Timken-Detroit Co., Detroit, was elected president and Trell Yocum, was appointed managing director.

## Cambria To Be Expanded

Improvements to the Cambria plant of the Bethlehem Steel Co. at Johnstown, Pa., are understood to involve expenditures of $5,500,000 as a part of the 1929 modernization program. Included in the 21 proposed changes are the relocation of the main high tension lines along the Westmont hillside and more economical production and modernization of gas cleaning facilities to improve the distribution and combustion of blast furnace gases.

## $100 and 25 tons of Pig Iron for Name

*MYSTIC IRON WORKS, at Everett, Mass., desires a brand name for the malleable iron which it is beginning to produce. It terms its foundry iron "Mystic" and proposes a characteristic brand for malleable.*

*"As a suitable reward," states the works, "we shall donate as a prize to the customer suggesting a name chosen a credit of 25 tons—either malleable or foundry up to 3 per cent silicon—on the next shipment of 50 tons or more made to such customer."*

*In addition, the individual in the customer organization submitting the winning name is to receive $100 in cash.*

## Reduce Limestone Rate

Freight rates on fluxing stone from western Ohio quarries to the Mahoning valley have been reduced 11 to 21 cents per gross ton, effective May 15. The new rate from western Ohio quarries to the Mahoning valley will be $1.05 per ton, and to Canton and Akron, O., 92 cents. From Painesville and Fairport, O., the rate to the Mahoning valley will be 80 cents and to Canton and Massillon 90 cents.

American Steel and Heavy Hardware association will hold its twentieth annual convention at Hotel Washington, Washington, May 21-23. B. R. Sackett, 503 Arch street, Philadelphia, is secretary-treasurer of the association.

## Valley Capacity Gains

Youngstown, O., April 16.—Steelworks operations are being maintained steadily around 92 per cent, being about 1 or 2 points higher than last week. One additional open hearth was gained by the independents to their active list this week, making 47 units active out of 51. Bessemer operations are confined to two turns. Steel corporation subsidiaries are running at 60 to 85 per cent. Independent bar mills are active at 75 per cent for the independents and 85 per cent for the Carnegie Steel Co.

Wrought pipe mill operations have gained one unit to the active list, now making 11 units active out of 20 welded and seamless units. Strip and independent tin mill operations are at capacity rates. The Byers puddle and skelp mills at Girard are active in all departments.

## Pig Iron

(*Concluded from Page* 1081)

proportions. Shipments continue on a record scale for this time of year, and the melt still moves steadily upward. Shipments during the first half of April slightly exceed those of the first half of March, and are considerably in excess of the corresponding period last year. Sales the past few days total about 3500 tons, including 750 tons of basic sold by the leading local producer to an Iowa user. Prices are firm.

**Birmingham, Ala., April 16.**—Production of pig iron is steady, with 18 blast furnaces in operation in Alabama. A little improvement is noted in spot buying. Surplus stock of foundry iron is not being reduced rapidly. The price continues $15.50, base, Birmingham. A little tonnage still is being shipped out of this territory, and for a few weeks some basic iron will be moved to the Ohio river district. Pressure pipemakers forecast production this summer at 80 per cent.

**Toronto, Ont., April 16.** — The Canadian pig iron prices that went in effect a week ago are firm, and there are prospects of further advances in the early future. Second quarter contracting is quiet, but spot demand is brisk.

**Philadelphia, April 16.**—Pig iron sales are fair, comprising mainly small and moderate lots of foundry grades and several lots of low phosphorus iron. Frank Samuel & Co. booked 670 tons of low phosphorus for the Washington navy yard. Eastern Pennsylvania producers have advanced foundry and basic 50 cents, now quoting $21.50, base, furnace, for foundry iron, and $20.50, furnace, for basic.

Union Drawn Steel Co., Beaver Falls, Pa., has leased office space in the new building of the Insurance Co. of North America, Sixteenth street and the Parkway, Philadelphia.

# Farrell Paints Bright Picture at Annual Meeting of Steel Corp.

NEW YORK, April 16.—Subsidiaries of the United States Steel Corp. are well booked into August and no material letup in the heavy demand for steel is in evidence, declared James F. Farrell, president of the corporation, at the annual meeting of the corporation yesterday at Hoboken, N. J.

In March, according to Mr. Farrell, the corporation shipped an average of 57,000 tons daily and booked new business at the rate of 66,000 tons daily. Present ingot capacity of all steel corporation plants is 25,000,000 tons, contrasted with 7,000,000 tons when the corporation was organized in 1901. In recent months ingot capacity has been expanded little if any, but finishing operations are broadening both in volume and diversification. Sales in 1928 were $1,374,443,433, and in 1929 are expected to reach $1,500,000,000.

Since February, 1928, Mr. Farrell and Myron C. Taylor, chairman of the finance committee, have visited practically every property of the corporation to obtain data for a more comprehensive budget. Mr. Farrell stated the corporation is expending approximately $100,000,000 a year in rehabilitating its numerous plants. He said a budget for expansion over the next three years has been developed.

Stockholders approved the proposal of directors that the authorized common share capital be increased from $753,321,000 to $1,250,000,000 and that bonds be retired. Directors of the corporation were expected to meet today to arrange for the issuance of further common stock probably on the basis of two shares at $110 each for every seven shares now held.

For the three years ending in 1932 George F. Baker Jr., William J. Filbert, Samuel Mather, Junius S. Morgan Jr. and Thomas Morrison were named directors.

A question was raised concerning a return of 3.03 per cent on the corporation's unappropriated surplus in 1928. This, it was pointed out by one of the stockholders, compares with 4.16 per cent in the preceding year and with substantially higher returns —returns better than 7 per cent—reported last year by certain other large industrial organizations.

Chairman Taylor explained that this surplus was represented in plants and working capital and trade and that, further, in view of the wide spread ramifications of the corporation, extending throughout the world, it was best in the opinion of the management to have a substantial working capital on hand. He pointed out that the corporation has cash in more than 100 banks throughout the world and that in view of the diversity of conditions in the vast area serviced by these banks it is particularly advisable to always have ample cash in reserve. The chairman deemed it highly important that the corporation not only borrow but also lend as little as possible. He stressed the thought that corporation funds should not be out on loans, the calling of which might prove detrimental to a vicinity.

Discussing briefly the corporation's latest research group, Chairman Taylor brought out the fact that the company has 115 laboratories located at plants throughout the country, employing 2000 research men. The efforts of the group will be co-ordinated with these various laboratories and will have as one of its chief functions "the setting of new thoughts in motion."

## Net Earnings Increased

Net earnings of the Harbison-Walker Refractories Co., Pittsburgh, for the first quarter totaled $1,190,000 after charges, equal after preferred dividends to $0.79 a share on the outstanding common stock. This compares with $0.68 a share in the corresponding period of last year.

All directors and officers have been re-elected. In addition, Kenneth Seaver, sales manager, and Raymond Willey, in charge of plant operations, were made vice presidents.

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The eighth annual state conference of the Massachusetts Safety council will be held at Boston, April 29-30.

# Steel Corporation Takes License for Rolling Sheets Continuously

NEW YORK, April 16.—United States Steel Corp. has completed negotiations with the American Rolling Mill Co., Middletown, O., for use of the latter company's patents for the rolling of sheets on continuous-type mills, it was announced officially last week. The terms under which the Steel corporation will use the patents have not been revealed.

The arrangement is understood to permit the Steel corporation to use these patents at the Gary, Ind., plant of the American Sheet & Tin Plate Co., a subsidiary company, as well as at any other plants of the corporation where mills of a similar type may be built during the next 14 years.

In response to an inquiry as to whether the Steel corporation had entered an arrangement to use the patents of the American Rolling Mill Co., James A. Farrell, president of the Steel corporation, made the following statement:

After an investigation extending over a considerable period in continuous sheet mill rolling, our engineers have recommended that the corporation authorize the American Sheet & Tin Plate Co., its subsidiary, to take out a license from the American Rolling Mill Co., to utilize its patents in the continuous rolling of sheet metal at its Gary sheet and tin plate mills, and also for any of this type mills which the corporation may build during the next 14 years, which constitutes the life of the patents, and accordingly an arrangement has just been concluded between the respective companies.

Early in 1924 the American Rolling Mill Co. started to construct at its Ashland, Ky., plant a mill for the continuous rolling of steel sheets, and in 1927 announced that its installation had been in operation on a commercial scale long enough to prove that it was sound in principle, design and construction. Since that time the process has proved of considerable economic importance to the iron and steel industry and has produced great changes in the sheet industry. At Ashland a 4-inch slab is advanced continuously to No. 16 gage without reheating and finally is brought to rest as No. 20 gage sheet, 45 inches wide and in commercial lengths. In 1928 the company built a similar mill at its Middletown, O., plant.

Independently of this development, the Columbia Steel Co. placed in operation at its Butler, Pa., plant in November, 1926, a revolutionary type of mill capable of rolling stripsheets in gages from 7 to 22, widths from 10 to 36 inches and lengths from 300 to 600 feet. In July, 1927, the American Rolling Mill Co. acquired by purchase the property and patents of the Columbia company. Consequently since that time, the Rolling Mill organization has had complete control of the processes for the continuous rolling of sheets and stripsheets.

# Here and There in Industry

Timely Information Which Records Developments in Various Lines of Productive Enterprise

NATIONAL-ERIE CO., Erie Pa., formerly the National Foundry Co., has bought the entire business and assets of the Williams Foundry & Machine Co., Akron, O. The purchase includes good will, patents, patterns and machine tool equipment, but not the real estate. A new building is under construction at Erie adjoining the present plant of the National-Erie Co. On its completion the Williams Foundry & Machine Co. division of the National-Erie Co. will be moved there. Officers of the new company are those of the National Foundry Co., as follows: President, E. W. Sheldon; general manager and treasurer, A. H. Willis; secretary and sales manager, A. W. Reichert. The company will manufacture a complete line of rubber mill machinery, cut gears, speed reducers and machined and rough castings.

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AMERICAN CAN CO. has moved its offices from 120 Broadway to 230 Park avenue, New York.

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VARIETY IRON & STEEL WORKS CO., Cleveland, B. D. Holt, receiver, is liquidating its complete iron and steel fabricating equipment.

* * *

DURALO CO., Pittsburgh, has opened a district sales office at 888 Arcade building, Cleveland in charge of J. H. Hobbs, formerly associated with Pioneer Alloys.

* * *

LALLY-McKELVEY INC., Union Trust building, Pittsburgh, has been appointed district representative in western Pennsylvania for Billings & Spencer Co., Hartford, Conn.

* * *

ROBINSON & ORR, 419 Wood street, Pittsburgh, dealers in iron and steel products, after April 18 will be located at 8 Columbia building, 248 Fourth avenue, Pittsburgh.

* * *

INTERNATIONAL STEEL CO., Canton, O., recently incorporated, will reopen the former plant of the Morgan Engineering & Foundry Co. at Canton.

* * *

FERRO ENAMEL SUPPLY CO., Cleveland, has taken a contract from the Coloric Gas Stove Works, Philadelphia, for an electric continuous porcelain enameling furnace, to be installed in its plant at Topton, Pa.

* * *

GOULDS PUMPS INC., Seneca Falls, N. Y., has established a sales office in the Union Trust building, Cleveland, in charge of T. S. Ireland, resident sales engineer.

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INDUSTRIAL BROWNHOIST CORP., Cleveland, will move its Pittsburgh office April 20 from the Oliver building to the new Koppers building. L. Kleinhans will continue in charge of the office.

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STANDARD AUTOMATIC PRODUCTS CORP., Corry, Pa., is completing arrangements to take over the entire business of the Standard Automatic Products Co. The charter of the new company gives wider powers than possessed by the old and better operation is expected.

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CENTURY WOOD PRESERVING CO., Pittsburgh, has opened a branch office at 1002 Finance building, Philadelphia. The Century company through subsidiary organizations operates plants in New Hampshire, Michigan, Ohio and Pennsylvania, and plans to start a plant in Delaware soon.

* * *

MORTON MFG. CO., Muskegon Heights, Mich., has bought the business, goodwill and patents of the former Dyett Auto Products Co., Little Falls, N. Y., including the line of keys made by the latter. The name of these keys has been changed from "Dyett" to "Hi-Pro," an abbreviation of "high production."

* * *

ALUMINUM INDUSTRIES INC., Cincinnati, manufacturer of aluminum alloy replacement pistons, has bought the Diamond Motor Parts Co., St. Cloud, Minn. The plant covers 130,000 square feet of floor space on a 15-acre tract. The company had been operating under a receiver for several months and is taken over by the purchaser from the receiver.

* * *

RECTOR GASIFIER CORP. has been organized at Waukesha, Wis., by officials of the Waukesha Motor Co. and others. It will manufacture a device invented by Enoch Rector, engineer for the motor company. This device has been designed for heavy duty gasoline engines. Crude oil is used for gasoline engine operation by means of the invention.

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WHEELING STEEL CORP. has re-elected Alexander Glass, chairman of the board, Alan H. Wood vice chairman, Isaac M. Scott president, Walter B. Higgins vice president, J. Earl Montgomery vice president, William H. Manning treasurer, Howard P. Beswick secretary, Rhodes D. Swinburne comptroller. The executive committee is unchanged.

* * *

MOTT & McELRATH ENGINEERING CORP., 249 West Eighteenth street, New York, has been appointed representative in the metropolitan district for the Orton Crane & Shovel Co., Chicago, manufacturer of crawling-tread cranes, shovels, draglines, ditchers and similar equipment. John Connell will be in charge of sales. Spare parts will be carried in stock and service will be provided.

* * *

PERRY & WHERRY, New York and Brooklyn, manufacturers of transmission machinery, have bought the business, stock and goodwill of the Coleman Power Transmission Co., Brooklyn, N. Y. The plant will be continued in production. Perry & Wherry, in addition to their own activities, represent the Dodge Mfg. Co., Chain Belt Co. and other manufacturers of transmission devices.

* * *

FOOTE-BURT CO., Cleveland, manufacturer of drilling, boring, reaming and tapping equipment, will discontinue the manufacture of washing machines, which was undertaken in 1921 to occupy capacity rendered idle following the war. Demand for its machine tools makes it necessary now to take over the productive facilities devoted to washing machines. G. E. Randles is president.

* * *

KELLY-DECKER CO., 39 Cortland street, New York, has been appointed exclusive sales agent in the United States and Canada for Aktiebolaget Alpha, Sundyberg, Sweden, manufacturer of a patented instrument for determining exact carbon content in the bath of open-hearth

and electric furnaces, either acid or basic. C. B. Collingwood, a practical open-hearth operator, will demonstrate the instrument.

* * *

WALLACE FOUNDRY & STEEL CO., Lafayette, Ind., has changed its name to Wallace Steel & Supply Co.

* * *

LYNCH GLASS MACHINE CO., Anderson, Ind., has re-elected T. C. Werbe president and treasurer, E. F. Dice vice president and Don E. Collins secretary.

* * *

AMERICAN GEAR CO. has purchased property at 972 Atlantic avenue, Brooklyn, for renovation and occupancy.

* * *

INLAND STEEL CO., Chicago, has moved its Wisconsin district sales offices from the Majestic building to the Bankers building, 84 East Wisconsin avenue, Milwaukee.

* * *

GREENVILLE STEEL CAR CO., Greenville, Pa., which has been engaged for 13 years in car repair work, has started building freight cars.

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SOUTH BEND FORGE CO., South Bend, Ind., recently incorporated, specializing in drop forgings, has nearly completed its new plant at 2700 West Moore street and expects to be in production before May 1.

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BALDWIN LOCOMOTIVE WORKS has purchased a 49 per cent interest in the George D. Whitcomb Co., Rochelle, Ill., manufacturer of gasoline locomotives, electric storage batteries, and electric trolley locomotives.

* * *

CAPITOL STEEL & IRON CO., Oklahoma City, Okla., has bought the Oklahoma Structural Steel Co. The latter is erecting a plant, which will be completed and enlarged by the new owners. Personnel of the Oklahoma Steel Co. will be absorbed by the Capitol company.

* * *

LANCASTER IRON WORK INC., Lancaster, Pa., has acquired the Hahn Engineering Co., Philadelphia, and will operate it as a division. The Hahn company formerly manufactured and installed a line of cast iron sectional bunkers, hoppers, partitions and similar devices.

* * *

CUTLER-HAMMER INC., Milwaukee, manufacturer of electrical devices, has established a warehouse at Hamilton avenue and East Ninth street, Cleveland, to supply the Cleveland district. A. G. Pierce, district manager, will administer the warehouse.

* * *

INTERSTATE SUPPLY & EQUIPMENT CO., Milwaukee, has been organized with Walter Gerlinger president, H. R. Donald vice president, and R. S. Witte secretary. The company will act as distributor for the Federal Foundry Supply Co. in Wisconsin, Minnesota, Upper Michigan and portions of Illinois and Iowa.

* * *

MURRAY IRON WORKS CO., Burlington, Iowa, manufacturer of steam turbines, engines and boilers, has appointed several new representatives, a follows: Frederick E. Bausch, 1605 Bausch building, St. Louis; T. T. Burchfield Co., 604 Arch street, Philadelphia; W. B. Tardy, 74 Knickerbocker building, Baltimore.

* * *

BORST ENGINEERING CO., recently founded at Buffalo with capital of $150,000, will lease a local factory building and begin production of a new type automobile cushion shackle. Production is planned on a large scale, according to officers of the company, of which Andrew J. Borst is president.

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PETROLEUM HEAT & POWER CO., Stamford, Conn., has purchased the property of Stollwerck chocolate works at an estimated cost of $1,000,000. The plant adds 135,000 square feet of floor space to the property of the company and will be used in oil burner manufacturing. An oil tank farm of 15,000,000 gallons will be established on the grounds.

* * *

READING IRON CO., Reading, Pa., has elected officers and directors, as follows: President, L. E. Thomas; vice presidents, John M. Callen, P. N. Guthrie Jr., R. J. Wenger; secretary, George W. Delany; treasurer, Henry N. Yost; directors, A. J. Maloney, Randolph Stauffer, L. E. Thomas, John M. Callen, P. N. Guthrie Jr. and R. J. Wenger.

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GISHOLT MACHINE CO., Madison, Wis., the Crocker First Co., San Francisco, Air Investors Inc. and others are understood to have financed the formation of the Comet Engine Co. to acquire all of the outstanding common and preferred stock of the Aircraft Engine Corp. of America, manufacturer of a 150-horsepower, seven cylinder, radial air-cooled airplane engine. The new corporation will have 125,000 shares of no par value stock, with 60,000 outstanding, and $400,000 in cash. Harvey L. Williams has been elected president and a director. He is a member of the executive committee of the recently formed Aviation Corp. and president of Air Investors Inc. John H. Geisse has been made vice president in charge of engineering. George H. Johnson, vice president and director of the Gisholt Machine Co., has been made a vice president and director.

* * *

BENDIX AVIATION CORP. has been formed at New York with General Motors Corp. holding a minority interest. The new company will acquire the Bendix Corp. and its subsidiaries, including Bendix Brake Co., South Bend, Ind.; Eclipse Machine Co., Elmira, N. Y.; Stromberg Carburetor Co. of America, Delco Aviation Corp., Scintilla Magneto Corp. and other companies interested in aviation accessories. General Motors Corp. is announced as about to turn over valuable rights in the aviation accessory field.

## Chicago Scrap Chapter Adds Members

Chicago, April 16.—Ten new members were added to the Chicago chapter of the Institute of Scrap Iron and Steel at a meeting to complete organization held here April 11. Among the speakers were Benjamin Schwartz, director general of the institute, and Arthur Lazarus, of Arthur Lazarus & Co., Chicago. By-laws of the Chicago chapter were accepted and committee organizations completed.

The membership committee consists of Merton Teller, Teller Iron Co., Chicago; W. J. Ross, Hyman-Michaels Co., Chicago; Walter I. Bregman, Price Iron & Steel Co., Chicago; Henry Rosenthal, Briggs & Turivas, Chicago, and I. Cohen, of the Cohen Iron & Metal Co., Milwaukee.

The goal of the Chicago chapter is 65 members by May 23. At that time a number of members from this territory will attend a meeting of institute members with representatives of the federal trade commission at Pittsburgh. The meeting here was attended by members and representatives of the scrap industry in several states adjacent to the Chicago territory.

E. T. Weir, president of the Weirton Steel Co., Weirton, W. Va., has established five scholarships, amounting to $3000 for four years, at the University of Pittsburgh as a memorial to his brother, the late D. M. Weir, formerly vice president of the Weirton company. These scholarships are to be awarded to caddies through the Western Pennsylvania Golf association.

## Commonwealth Steel To Be Merged?

Commonwealth Steel Co., Granite City, Ill., manufacturer of cast steel railroad equipment specialties, is to be merged with the General Steel Castings Corp., Eddystone, Pa., if a plan outlined by the management and distributed among stockholders is ratified.

The general corporation was organized early this year by the American Steel Foundries, American Locomotive Co., and Baldwin Locomotive Works, with a capital of $20,000,000 to cast integral locomotive beds and tender frames. Five buildings, providing 500,000 square feet of floor space, are being erected at Eddystone, near Philadelphia.

Two 50-ton electric furnaces comprise the initial installation at Eddystone. The Commonwealth company operates six basic open-hearth furnaces and has an annual capacity of not quite 100,000 tons.

## Eleven Join Institute

American Institute of Steel Construction Inc., New York, recently added to its membership the following companies: Decatur Iron & Steel Co., Decatur, Ala.; Fort Wayne Foundry & Machine Co., Fort Wayne, Ind.; Hutchinson Foundry & Steel Co., Hutchinson, Kans.; Lyons Iron Works Inc., Manchester, N. H.; Utica Structural Steel Corp., Utica, N. Y.; Ohio Structural Steel Co., Newton Falls, O.; Toledo Wire & Iron Co., Toledo, O.; Kilroy Structural Steel Co., Cleveland; Wayne Iron Works, Wayne, Pa.; Allison Steel Mfg. Co., Phoenix, Ariz.; and American Hawaiian Steel Co., Honolulu, T. H.

## Will Unveil Tablet

Newcomen society, organized to study the history of engineering and technology, will hold its fifth annual meeting at the Engineers club, New York, April 24. Preceding the meeting, a ceremony accompanying the unveiling of a bronze tablet to commemorate Josiah Hornblower, who built the first steam engine of the fired type in this country, will be conducted.

## Barge Steel on Michigan

Chicago, April 16.—Barge shipments of finished steel from the Chicago district to Milwaukee have been inaugurated by the A. O. Smith Corp., Milwaukee, to compare water costs with those of rail shipment. The Smith corporation this month is taking 75,000 tons of plates for welded pipe lines and other purposes and 30,000 tons of strip for its automotive frame department.

## Pittsburgh to Push Its River Terminal

Pittsburgh, April 16.—This city is attempting to push plans for construction of the first unit of a river and rail terminal on the Ohio river, cost of which is estimated at $500,000. Completion of work on the river, permitting year-round navigation from Pittsburgh to Cairo, Ill., stresses the need for dock facilities. At present, no municipal dock is in operation, shipments now carried on being moved through private facilities. Plans for the new terminal have been worked out and a hearing will be held on the project shortly.

## Buffalo Plant Is Opened

Buffalo, April 16.—Officials, financiers and manufacturers attended a buffet luncheon and inspected the new plant here of Bliss & Laughlin Inc., April 13, when the plant was formally opened. Paul J. Kalman, president of the company, which cold finishes bars and shafting, was in charge.

The main plant of Bliss & Laughlin Inc. is at Harvey, Ill. The Buffalo plant will employ 150 men. Sales in the Buffalo, Rochester and Syracuse areas will be handled by Brace-Mueller-Huntley Inc.

## Merge With Minneapolis Steel, Machinery

Farm Implement & Tractor Mfg. Corp., with executive and administrative offices in Minneapolis, has been formed to take over the business of the Minneapolis Steel & Machinery Co. and Minneapolis Threshing Machine Co., both of Minneapolis, and the Moline Implement Co., Moline, Ill. A complete line of farm implements will be offered by the new corporation, which has assets approximating $30,000,000.

## Less Cement Is Made

Production of Portland cement in March was 9,969,000 barrels, shipments 10,113,000 barrels and stocks at the close of the month 29,727,000 barrels, according to the bureau of mines, department of commerce. Compared with March, 1928, production showed a decrease of 2.5 per cent and shipments a decrease of 0.2 per cent. Stocks at the mills were 8.3 per cent higher than a year ago. The industry in March operated at 47.4 per cent of capacity, contrasted with 44.8 per cent in February and 51.7 per cent last March.

A symposium on lubrication was held recently in Worcester, Mass., under the auspices of the local section of the American Society of Mechanical Engineers. Prof. W. K. Lewis, Massachusetts Institute of Technology, Cambridge, Mass., was the principal speaker.

# Gray Iron Institute To Promote Wider Use of Gray Iron Castings

FORCEFULLY presenting the story of the Gray Iron institute and its aims, Arthur J. Tuscany, manager of that group, addressed about 100 gray iron foundrymen at a luncheon at the Stevens hotel, Chicago, April 11. Following the address a number became affiliated with the institute.

Several members asserted that the results in time and money saved, and gains in research knowledge, already have been well worth while. Mr. Tuscany presented interesting charts to show how inattention to merchandising, lack of standardization, and various substitutes are affecting the use of gray iron castings. He compared the gain of 100 per cent in steel castings use, from 11.2 pounds per capita population to 21.9 pounds, in the period 1901 to 1925, as against a loss of 15 per cent, from 112 pounds per capita to 97 pounds, in the use of gray iron castings during the same period.

Analyzing the competition of stamped and welded steel construction, Mr. Tuscany pointed to alleged misleading and mis-statements that have been broadcast, some under the guise of engineering group sponsorship, to the detriment of the gray iron industry.

Mr. Tuscany analyzed sales promotion and huge advertising campaigns of other trade groups, and told what had been accomplished. Asserting that every major industry has had to solve similar problems, he declared that a position of economic strength actually exists for the gray iron industry. New marketing possibilities, such as cast iron road signs, that have been found most acceptable for New York state, were mentioned.

# Industrial Men in the Day's News

## Fred Erb, New President, American Foundrymen's Association

*TWENTY-one years in the foundry industry are climaxed with the presidency of the country's leading foundry association.*

*MEMBER of a cupola charging crew in 1908, he forged ahead and in 17 years became president of the Erb-Joyce Foundry Co.*

*HE SERVED the Detroit Foundrymen's association as secretary, president and as a committee member; he also has held committee posts in the national body and for the past year has been its vice president.*

ELECTION of Fred Erb, president of the Erb-Joyce Foundry Co., Detroit, as president of the American Foundrymen's association, comes appropriately as Mr. Erb attains his majority in the foundry industry. Exactly 21 years ago, in 1908, on being graduated from the University of Michigan, Mr. Erb entered the foundry industry in Detroit and, save for a brief period in Elmira, N. Y., he has been connected with it ever since.

Mr. Erb's election, as noted briefly last week in IRON TRADE REVIEW, took place at the association's thirty-third convention at Chicago. For the past year he has been vice president of the association.

Leaving the university with a degree in mechanical engineering, Mr. Erb in 1908 became a member of the cupola charging crew of the Detroit Foundry Co. Here he worked up through the shop to the position of foundry superintendent in a comparatively short time and later became manager. He left that plant in 1913 to assist in the organization of the Lakeside Foundry Co., also of Detroit. Shortly afterward he became identified with the Elmira Foundry Co., Elmira, but his interests in Detroit prompted his early return to that city, where he was appointed superintendent of the foundry division of the Packard Motor Car Co. In 1920 he was promoted to manager of that department, from which he resigned in 1925 to become president of the newly organized Erb-Joyce Foundry Co., which operates a plant at Vassar, Mich.

Mr. Erb was born in 1886 at Royal Oak, Mich., a suburb of Detroit, where he has always maintained his home. He has been a member of the Detroit Foundrymen's association for more than 18 years and has served as its secretary, president and on its various committees such as the program and papers, molding sand research, finance, etc. From 1920 to 1926 he served on the board of directors of the American Foundrymen's association and last year was elected vice president. He also has served this body on its cost, convention and exhibition, and other committees.

His address before the June, 1925, meeting of the New England Foundrymen's association on "Production and Inventory Control in an Automobile Foundry" attracted widespread favorable comment.

# Men of the Industry

A. L. HUMPHREY, president of the Westinghouse Air Brake Co., has been elected chairman of the board of the Union Switch & Signal Co., Swissvale Pa., to succeed the late W. D. Uptegraff. George A. Blackmore, formerly vice president and general manager of the Union Switch company, has been made president of that organization to succeed Mr. Humphrey.

C. A. Rowan, Pittsburgh, has been elected a director of Westinghouse company, succeeding Mr. Uptegraff. Mr. Rowan is president of the Westinghouse International Brake & Signal Co., and has been identified with Westinghouse interests since 1894.

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S. S. Hughes, for many years in the pig iron sales department of the Corrigan, McKinney Steel Co., Cleveland, has resigned.

* * *

J. F. Shea, formerly of the Philadelphia sales office of the Trumbull Steel Co., has become affiliated with the sales office of the A. M. Byers Co., Morris building, Philadelphia.

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S. D. Den Uyl was recently elected secretary of the Bohn Aluminum & Brass Mfg. Co., Detroit, to succeed A. P. Lauer, who remains as director of the company.

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L. M. Lindsey, formerly affiliated with the Celite Products Co., Chicago, is now on the sales force of Holcroft & Co., Detroit, builders of melting furnaces, ovens, etc.

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Samuel E. Bool, partner of Pickands, Mather & Co., Cleveland, has been added to the board of directors of the Central National bank, Cleveland.

* * *

Christian A. Wills, formerly general shop superntendent of the William B. Pollock Co., Youngstown, O., has been made general manager. He has been with the company for about 25 years.

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Floyd F. Dore, Alliance, O., has been named chief chemist of the American Steel Foundries, Chicago, and will be in charge of steel making in nine plants owned by the company. Mr. Dore has been chemist of the Alliance plant for more than eight years.

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A. B. Jonas, formerly identified with the New York office of Crosby Co., Buffalo, maker of sheet metal stampings, has been placed in charge of its Philadelphia district. Headquarters are at 121 North Broad street, Philadelphia.

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R. Z. Zimmermann, affiliated with Day & Zimmermann Inc., Philadelphia, since 1916, was recently elected vice president in charge of purchasing for the United Gas Improvement Co., Philadelphia, the parent company.

I. E. WALTON
Appointed purchasing agent, Heppenstall Forge & Knife Co., Pittsburgh, as noted in IRON TRADE REVIEW, April 4

He succeeds J. A. Pearson, who retires after 40 years' service.

* * *

F. L. Ebersole, engineer for the past six years in the engineering and construction departments at the Midland plant and Park works, Pittsburgh, of the Crucible Steel Co. of America, has joined the James Criswell Co., engineer and contractor, Keenan building, Pittsburgh. His previous experience includes three years in an engineering capacity with the Central Iron & Steel Co., Harrisburgh, Pa.

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H. E. White has been made general works manager of all plants of the Truscon Steel Co., Youngstown, O. A. H. Schaffert has been appointed works manager at Youngstown. T. E. McLaughlin, formerly general superintendent of the Youngstown plant, has been named works manager of the Hydraulic division at Cleveland. Paul J. Arens, formerly assistant superintendent, becomes general superintendent.

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Jesse F. Monfils, for 21 years identified with the Michigan Steel Castings Co., Detroit, the last several as secretary and sales manager, has been appointed representative in Michigan for the Ohio Steel Foundry Co., Lima, O. His headquarters are 304-6 Boulevard Temple building, Detroit.

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S. H. Truitt has been made Philadelphia district sales manager of the Central Alloy Steel Corp., Massillon, O., to succeed C. C. Willitts, resigned. Mr. Truitt formerly was assistant sales manager at Philadelphia and has been with the company for several years.

* * *

L. R. Scafe, general manager of Fisher Body Co. of Ohio, Cleveland, has been elected director of the Cleveland chamber of commerce for a term of one year; Herbert K. Oakes, vice president, Bethlehem Transportation Corp., Cleveland, and Tyler W. Carlisle, vice president of Strong, Carlisle & Hammond Co., Cleveland, were elected for 2-year terms.

* * *

William J. McAneeny was elected president and general manager of the Hudson Motor Car Co., Detroit, to succeed Roscoe B. Jackson, who died last month in France. Mr. McAneeny has been affiliated with the company since 1909 in various capacities but has been first vice president and treasurer since 1923. He previously had served successively as purchasing agent, factory manager, director and secretary.

* * *

E. P. Boyer, for 10 years with the Alexander Milburn Co., Baltimore, maker of acetylene welding apparatus, as well as its subsidiary companies, was recently elected vice president. Mr. Boyer's initial connection with the company was as Philadelphia district sales manager. In 1926 he established the Milburn Sales Co., taking charge of the Philadelphia territory and later New York and Chicago. In 1928 he was elected vice president of the Milburn Sales Corp. and the Milburn Paint Spray Corp., distributor of the products of the Alexander Milburn Co.

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R. S. Poister, who recently resigned as metallurgical engineer in charge

of the Pittsburgh office of the Electro Metallurgical Sales Corp., has been appointed general superintendent of the Alan Wood Steel Co., Ivy Rock, Pa. Previous to joining the Metallurgical corporation about three years ago, Mr. Poister was open-hearth furnace superintendent at the plant to which he now returns. He received his advanced education at Case School of Applied Science, Cleveland, obtained employment at the Cleveland Furnace Co., Cleveland, and after leaving there with the United Alloy Steel Corp., Canton, O., for about 10 years. The latter part of that period he was superintendent of electric furnaces and plant A open-hearth furnaces, which position he resigned to go to Ivy Rock, Pa.

* * *

Raymond M. Sievers, who was appointed St. Louis district sales manager of Harbison-Walker Refractories Co., Pittsburgh, is a native of St. Louis and has been a member of the American Refractories institute since its formation. From 1904 to 1928 Mr. Sievers was connected with the Evens & Howard Firebrick Co., St. Louis. In 1917 he was appointed sales manager of that company in charge of all firebrick sales, and in 1925 was elected vice president and general sales manager and director. His headquarters now will continue in St. Louis and his territory will extend from the Mississippi river to the Rocky Mountain states.

RAYMOND M. SIEVERS

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Charles P. Rogers, vice president, secretary and treasurer of Beals, McCarthy & Rogers, Buffalo jobbers, was elected president to succeed the late Eugene J. McCarthy. Mr. Rogers has been affiliated with the company since 1880.

* * *

James H. Whitaker, for many years associated with the Brown & Sharpe Mfg. Co., Providence, R. I., the Pratt & Whitney Co., Hartford, Conn., and the Davenport Machine Tool Co., Rochester, N. Y., was recently appointed general superintendent of the Cincinnati Planer Co., Cincinnati.

* * *

Lawrence P. Marshall, of the Standard Electric Time Co., Springfield, Mass., has been elected president of the Purchasing Agents' association of Western Massachusetts.

Frederick Marton, of the Holyoke Valve & Hydrant Co., Holyoke, Mass., was elected secretary.

* * *

Harold D. Smith, for many years district representative of the Colonial Steel Co., Pittsburgh, resigned recently to become Connecticut district representative of the Cyclops Steel Co., Titusville, Pa. The latter company's New York office is located at 10 East Fortieth street.

* * *

John D. Knox, associate editor, IRON TRADE REVIEW, Cleveland, was seriously injured April 15, in an automobile accident. Mr. Knox, with his wife Olive Rugh Knox and daughter Susanne, was driving from Cleveland to New Castle, Pa., where he had been called by the death of his father, John H. Knox, retired manufacturer of that city. A few miles east of Chagrin Falls, the Knox automobile collided with a truck, which, due to faulty steering gear, was on the wrong side of the road. Mrs. Knox was killed instantly. The daughter Susanne escaped with minor bruises. Mr. Knox, who sustained a fractured skull and other injuries, was taken to St. Lukes hospital, Cleveland.

* * *

J. H. Van Campen has been appointed chief engineer of the Warren, O., division of the Republic Iron & Steel Co., Youngstown, O. He succeeds J. A. Clauss, whose affiliation with the Great Lakes Steel Corp., Detroit, as chief engineer was noted in IRON TRADE REVIEW, April 4. Mr. Campen comes to the Republic company from the E. W. Bliss Co., Salem, O., builder of mills, presses and other mill machinery. At one time (1919) he was steel plant engineer for the Timken Roller Bearing Co., Canton, O., and in July of that year became affiliated with the engineering department of the Midvale Steel & Ordnance Co.

R. H. Sillicow, assistant civil engineer of the Warren, O., division of the Republic company, was made civil engineer.

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H. B. Kraut, formerly vice president and general manager of the Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., has been elected president and chairman of the board of directors, following reorganization and refinancing. He succeeds Fred J. Rueping, who recently retired as president.

Mr. Kraut assumed the management of the Giddings & Lewis enterprise in 1924. He is a native of Germany and, following his graduation from the Munich Institute of Technology, came to America in 1906. For 16 years he was identified with Jos T. Ryerson & Son Inc., Chicago, in charge of the operating end of its machinery department, traveling extensively in connection with its export trade.

H. B. KRAUT

W. J. Radcliffe was elected first vice president, A. T. Brenner second vice president, G. P. Heathcote treasurer, and F. W. Chadbourne secretary. Mr. Radcliffe is from Cincinnati, being president of the E. A. Kinsey Co., machine tool dealer.

K. F. Gallimore will continue to serve as chief engineer, W. E. Rutz as works superintendent, and Carl Gebuhr, in charge of sales.

* * *

John A. Westman, secretary and general manager of the Dahlstrom Metallic Door Co., Jamestown, N. Y., was the guest of honor at a dinner given by plant executives in the Hotel Jamestown, the occasion being the twenty-fifth anniversary of Mr. West-

(*Concluded on Page* 1106)

# British Outlook Encouraging

## British Markets Strong, and Exports Increasing—Additional Blast Furnaces To Be Lighted—Americans Buying Low Phosphorus Iron and Steel Channels—English Makers Negotiating with Soviet for Track Material

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, April 16.—(*By Cable*)—The outlook for the British iron and steel industry as reflected at the Birmingham quarterly meeting is distinctly favorable. Prices are tending upward. Middlesbrough pig iron is strong, and three additional stacks are to be lighted. Export trade is increasing. The market for hematite also is satisfactory. Orders for east coast low phosphorus iron are coming from the Continent and America. Billets are obtained with difficulty. Demand for heavy and finished steel is improving. British firms are negotiating with the soviet government for contracts for track material. The market for galvanized sheets continues quiet, while shipment of tin plate is heavy.

Paris reports the steel industry and markets in strong position. A report from Berlin states trade is steady. Steel channels are being sold to American consumers. Japanese buyers are paying extra to obtain wire rods. In Belgium trade is quieter, but general conditions are reported satisfactory.

British production of pig iron in March amounted to 590,500 tons, compared with 520,000 tons in February and 563,900 tons in January. On April 1, 145 stacks were in blast, three more than on March 1. Steel ingot production in March totaled 859,900 tons, against 775,000 tons in February and 761,600 tons in January.

British iron and steel imports in March amounted to 182,107 tons, compared with 163,474 tons in February and 244,267 tons in January, March exports totaled 350,138 tons, against 417,127 tons in February and 421,191 tons in January.

# British Iron Makers Blow in More Furnaces

BIRMINGHAM, Eng., April 5.—Shipments of pig iron from the Tees in March were the heaviest for nearly three years and totaled 24,873 tons, compared with 14,915 in February. This is one of the most encouraging returns in the British iron and steel trade, and optimism is further justified by the declining imports of iron and steel which are now lower than they have been since January, 1924.

Market conditions in the Middlesbrough district have been quiet during the holiday week. Consuming works were idle and deliveries of iron suspended, but stocks that accumulated will soon be absorbed as pressure for delivery under contracts has recently been heavy. Two furnaces are to be restarted to relieve pressure for prompt iron. Shipments so far this month are heavy and promise to be as satisfactory as those in March. Prices are firm.

**Sterling $4.85**

In the Barrow area stocks of hematite are practically exhausted and there is every prospect of additional furnaces being lighted as business is developing satisfactorily. The United Steel Co. has announced its intention of relighting a furnace at Workington to supply an increasing demand for manganese alloys. A large new furnace is also being put into blast

# Current Iron and Steel Prices of Europe

| Dollars at Rates of Exchange, April 15 | *British* Gross Tons U. K. Ports | | *French* Metric Tons Channel Ports | | *Belgium and Luxemburg* Metric Tons Channel Ports | | *German* Metric Tons Rotterdam or North Sea Port | |
|---|---|---|---|---|---|---|---|---|
| **Export Prices f. o. b. Ship at Port of Dispatch—By Cable** | | | | | | | | |
| **PIG IRON** | £ s d | | £ s d | | £ s d | | £ s d | |
| Foundry No. 3, Silicon 2.50-3.00 | $16.61 | 3 8 0 | $16.98 | 3 10 0 | $16.98 | 3 10 0 | $16.49 | 3 8 0 |
| Basic | 15.76 | 3 5 0 | 16.01 | 3 6 0 | 16.01 | 3 6 0 | 15.76 | 3 5 0 |
| Basic-bessemer | 17.58 | 3 12 6† | 16.01 | 3 6 0 | 16.01 | 3 6 0 | 15.76 | 3 5 0 |
| Hematite, Phosphorus 0.02-0.05 | 17.95 | 3 14 0 | 23.66 | 605* | ..... | ..... | 17.46 | 3 12 0 |
| **SEMIFINISHED STEEL** | | | | | | | | |
| Billets | $31.53 | 6 10 0 | $25.70 | 5 6 0 | $25.70 | 5 6 0 | $25.22 | 5 4 0 |
| Wire rods | 41.83 | 8 12 6 | 30.92 | 6 7 6 | 30.92 | 6 7 6 | 30.92 | 6 7 6 |
| **FINISHED STEEL** | | | | | | | | |
| Standard rails | $37.59 | 7 15 0 | $31.53 | 6 10 0 | $31.53 | 6 10 0 | $32.01 | 6 12 0 |
| Merchant bars | 1.79c | 8 5 0 | 1.34c | 6 2 0 | 1.34c | 6 2 0 | 1.36c | 6 4 0 |
| Structural shapes | 1.60c | 7 7 6 | 1.11c | 5 1 0 | 1.11c | 5 1 0 | 1.12c | 5 2 0 |
| Plates, ship, bridge and tank | 1.76c | 8 2 6 | 1.39c | 6 6 0 | 1.39c | 6 6 0 | 1.38c | 6 5 0 |
| Sheets, black, 24 gage | 2.28c | 10 10 0 | 2.26c | 10 5 0 | 2.26c | 10 5 0 | 2.50c | 11 7 0 |
| Sheets, galvanized, 24 gage, corrugated | 2.90c | 13 7 6 | 3.01c | 13 13 9 | 3.01c | 13 13 9 | 3.43c | 15 12 0 |
| Bands and strips | 2.17c | 10 0 0 | 1.40c | 6 7 6 | 1.40c | 6 7 6 | 1.40c | 6 7 6 |
| Plain wire, base | 2.06c | 9 10 0 | 1.71c | 7 15 0 | 1.71c | 7 15 0 | 1.71c | 7 15 0 |
| Galvanized wire, base | 2.93c | 13 10 0 | 2.12c | 9 12 6 | 2.12c | 9 12 6 | 2.20c | 10 0 0 |
| Wire nails, base | 2.39c | 11 0 0 | 1.79c | 8 2 6 | 1.79c | 8 2 6 | 1.76c | 8 0 0 |
| Tin plate, base box 108 pounds | $ 4.37 | 0 18 0 | ..... | ..... | ..... | ..... | $ 6.79 | 1 8 0 |

*Francs

| **Domestic Prices at Works or Furnace—Last Reported** | | | Francs | | Francs | | Marks | |
|---|---|---|---|---|---|---|---|---|
| Foundry No. 3 Pig Iron, Silicon 2.50—3.00 | $16.25 | 3 7 0 | $18.57 | 475(2) | $16.82 | 605 | $18.49 | 78 |
| Basic pig iron | 15.76 | 3 5 0 | 19.94 | 510(1) | 16.96 | 610 | 20.86 | 88 |
| Furnace coke | 3.52 | 0 14 6 | 5.87 | 150 | 5.56 | 200 | 5.10 | 21.50 |
| Billets | 30.92 | 6 7 6 | 23.07 | 590 | 25.99 | 935 | 28.68 | 121 |
| Standard rails | 1.79c | 8 5 0 | 1.46c | 810 | 1.63c | 1,250 | 1.51c | 140 |
| Merchant bars | 1.79c | 8 5 0 | 1.36c | 755 | 1.41c | 1,085 | 1.52c | 141 |
| Shapes | 1.71c | 7 17 6 | 1.26c | 700 | 1.22c | 940 | 1.49c | 138 |
| Plates, ship, bridge and tank | 1.87c | 8 12 6‡ | 1.54c | 855 | 1.46c | 1,125 | 1.71c | 158 |
| Sheets, black, 24-gage | 2.28c | 10 10 0 | 2.92c | 1,620 | 2.70c | 2,080 | 2.43c | 225 |
| Sheets, galvanized 24 gage, corrugated | 2.93c | 13 10 0 | 3.69c | 2,050 | 3.84c | 2,950 | 3.78c | 350 |
| Plain wire | 2.06c | 9 10 0 | 1.89c | 1,050 | 2.08c | 1,600 | 2.48c | 230 |
| Bands and Strips | 2.17c | 10 0 0 | 1.51c | 840 | 1.76c | 1,350 | 1.77c | 164 |

*Middlesbrough; †Scotch foundry iron; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 15s 0d ($3.64) f. o. b. Ferromanganese £21 13s, 0d ($105.00) delivered Atlantic seaboard, duty-paid. German ferromanganese £15 0s 0d ($72.75) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

at Moss Bay in a few weeks period.

The only offers of continental material in Birmingham relate to German billets at about £6 3s ($29.82) delivered, but there is little attraction in this for local works, as English and Welsh billets can be bought at £6 7s 6d ($30.91) upwards, without the troublesome delays and methods of trading always connected with purchases from the continent. English semifinished steel is in better demand following increased activity among finished steelmakers. In the Middlesbrough district the call for structural steel is strong, but Birmingham engineers still find conditions far from satisfactory, and quieter than before the holiday. There is some speculation as to the prospects of quarter day, next Thursday. Heavy steel prices are fixed by the Steel association and in view of increases in production costs some makers feel that an advance in heavy steel is overdue. On the other hand, with the prospect of a steady trade revival others consider an advance would be fatal to the interests of English steelworks. Many consumers are obliged under the rebate scheme to buy British steel, and it is believed that this system has worked fairly well.

It is much more likely that finished Staffordshire iron will be advanced on quarter day. The price has remained at £12 ($58.20) per ton for about 12 months and most of the mills have been running continuously since last July. But fuel and pig iron have increased by a considerable amount and marked bar makers while at present well stocked with these materials will have to come into the market later on. They will then find that production costs have risen by a substantial amount. Marked bar mills have been closed for the week, not through a shortage of orders, but on account of the closing of consuming works.

Heavy steel mills both at Middlesbrough and Barrow are actively engaged and the outlook is more hopeful, although capacity is not fully employed.

Steel exports from the Tees in March were down on the month, but as output is steadily increasing it is obvious that more steel is being consumed in Britain. Steel bars are appreciating, the quotation being £8 2s 6d ($39.40) to £8 5s ($40.00). Rail makers and sheet rollers in the Middlesbrough district have good order books.

# Belgian Market Feels Shortage in Semifinished Steel Supply

**France—2.78c**

BRUSSELS, April 5.—(*European Staff Service*)—The Belgian iron and steel market has not been particularly active, as attendance at the iron and steel exchange was much restricted, as many exporters were still away on their easter holiday. Notwithstanding this period of relative quiet, the market was firm, but the orders booked were not numerous. The decisions taken at the meeting of the international rail manufacturers' association had a good effect and resulted in a hardening of prices, as merchant and producers realize that renewal of this agreement will have an invigorating effect on the steel entente, if nothing new occurs. The Belgian coke sales organization has decided to increase prices by 5 francs (14c) per ton. The new price will be 210 francs ($5.85) f.o.t. destination, as against 185 francs ($5.15) f.o.t. mine. An equal increase has been accepted in France and Luxenburg.

Generally speaking, coal is not easy to get, and it is said that Ougrée-Marihaye has blown out two stacks, which will remain out so long as this company has difficulty in providing itself with fuel. The export market is not very active. China again begins to be under the agitation of revolutionist leaders, and battles are announced from time to time, which prevents users from buying as in the past. Some commodities which a month ago were worth £5 ($24.25) now are sold with difficulty at a maximum price of £4 17s 6d ($23.55) f.o.b. Antwerp.

Shortage of semifinished products continues serious, and it is practically impossible to buy an important tonnage. Quotations are firm. Six-inch blooms are quoted at £4 17s ($23.50) and 4-inch blooms at £5 2s ($24.65). Two-inch billets are £5 6s ($25.65) and 3-inch and 4-inch billets are £5 3s ($24.96). Sheet bars are sold at £5 6s ($25.65) to £5 7s ($25.80), but the Germans have quoted £5 7s ($25.80) for the heavy sizes and £5 9s ($26.35) for the light sizes. Many Belgian works are short of semifinished products, and rolling mills which do not themselves manufacture their steel encounter many difficulties.

The merchant bar department is rather dull and weak. Quotations are around £6 2s ($29.50). Beams, normal profile, are quoted at £5 1s ($24.50), and English sections at £5 3s ($24.96). It seems there are important inquiries for hoops. The home market for merchant bars is satisfactory. Basic bessemer wire rod is quoted at 1125 francs ($31.25) delivered works Three-sixteenths-inch plates are quoted at £6 6s ($30.50), ⅛-inch plates at £6 11s ($31.65) and ¼-inch plates at £6 16s ($33).

# German Steel Buying Reviving; Many Factors Are Unfavorable

BERLIN, April 5.—(*European Staff Service*)—Following the period of comparative standstill brought about by the intensely cold weather, business in Germany is only gradually reviving, mainly owing to shortage of funds, uncertainty with regard to further development of economic activity, and reluctance of railroads to place new contracts. State railroads last year placed orders with the industry aggregating 1,500,000,000 marks ($355,000,000). Normally the railroads spend 300,000,000 marks ($71,000,000) annually for locomotives and cars, 250,000,000 marks ($59,000,000) for permanent way, 120,000,000 marks ($28,500,000) for renewal of rolling stock, parts, etc. At present, however, the unfavorable financial position of the railroads causes them to reduce their purchases. Requirements of the building trade are expected to be as great this year as in 1928, but it is feared the volume of business will be restricted, as the unsatisfactory situation on the American bond market will render financing of these activities difficult.

Although the international railmakers' association has been prolonged for six years, and although the American producers have joined, nothing definite can as yet be said in regard to the termination or prolongation of the European raw steel association. The differences between Krupps, the Vereinigte Stahlwerke and Mannesmann have not yet been overcome, and they seem to form one of the principal factors in these questions. In well-informed circles, however, attention is drawn to the fact that none of the parties concerned would greatly profit by cancellation of the existing agreement. In the Ruhr district new troubles are prepared by the denunciation of the coal miners' wage agreements, effective April 30.

Whereas domestic business is rather dull, export sales have registered some improvement. In February, foreign sales lagged behind those of January. Decrease of exports in February was partly due to the shorter month, and partly to the fact that transportation on the rivers was closed, owing to the severe cold.

Foreign sales of beams made a drop from 11,302 metric tons to 6793 tons, those of merchant bars from 71,450 tons to 53,978 tons, and those of bands from 11,427 tons to 9131 tons. Particularly unsatisfactory were exports of pig iron, which declined from 28,475 metric tons to 17,367 tons. Of late the semifinished products department has been rather quiet, but times of delivery average about three to four weeks. Merchant bars have been sold to foreign countries in larger quantities.

It is interesting to note that German consumption of all kinds of plates and sheets declined from 32.76 kilos per capita in 1927 to 29.20 kilos in 1928. In 1913 the figure was 27.21 kilos. As to the per capita consumption of tin plate in 1928, 2.02 kilos were absorbed, compared with 1.98 kilos in 1927 and 1.85 kilos before the war.

## Will Build Steel Plant in Russia

Engineers associated with the Freyn Engineering Co., Chicago, have sailed for Russia to fulfill a contract recently entered into by that company with the soviet government. A number of steel mill engineers have been added to the Freyn organization to handle this work abroad. Among the new members are the following: Earl H. Collester, coke oven work, formerly with Wheeling Steel Corp., Weirton Steel Co. and Koppers Co.; L. R. Dwyer, open hearths, formerly with Central Alloy Steel Corp., Broken Hill Proprietary Co., Australia, and Lackawanna Steel Co.; W. S. Orr, engineer, formerly with Central Alloy Steel Corp. and Jones & Laughlin Steel Corp.; Walter H. Leck, rolling mills, formerly with Scullin Steel Co., American Tube & Stamping Co., Bethlehem Steel Corp. and Wisconsin Steel Co.; Lee H. Mandeville, electrical engineer, formerly with Acme Steel Co., Columbia Steel Corp., Wickwire-Spencer Steel Co. and Pittsburgh Crucible Steel Co.; Frank Herzog, engineer, formerly with Wickwire-Spencer Steel Co., Donner Steel Co., Pittsburgh Seamless Tube Co. and Pittsburgh Crucible Steel Co.; Vance A. Cronk, electrical engineer, formerly with American Rolling Mill Co., Columbia Steel Co., Pittsburgh Crucible Steel Co. and Ford Collieries Co.; J. V. McCartney, formerly with Wilputte Coke Oven Corp., Dwight P. Robinson & Co., Youngstown Sheet & Tube Co. and Illinois Steel Co.

The group, with several members of the Freyn organization, will be headed by L. E. L. Thomas, vice president of the Freyn Engineering Co. It will plan and construct 18 new metallurgical plants and rehabilitate 40 others.

## Selects Paris for 1929 Management Congress

Engineers from all major industrial nations will assemble in Paris for the fourth International Management congress June 19 to 23. Unprecedented interest has been shown in this meeting, although remarkable participation was displayed in the previous gatherings in Prague in 1924, in Brussels in 1925 and Rome in 1927.

The United States is expected to be well represented and a good attendance is anticipated from Japan. American participation is being handled by a joint committee representing the American Society of Mechanical Engineers, American Management association, Society of Industrial Engineers and Taylor society. Fifteen papers have been contributed through this committee to a large international program.

English will be one of the official languages and all the papers will be available in that language. The congress will be organized under six divisions of industry, namely: Agriculture, commerce, administration, domestic economy, methods and propaganda.

## Buy Into Bourne-Fuller

Cyrus S. Eaton, Cleveland, and associates, already interested financially in the Central Alloy Steel Corp., Republic Iron & Steel Co., Youngstown Sheet & Tube Co., and Inland Steel Co., are understood to be negotiating for 51,000 shares of the Bourne-Fuller Co., Cleveland. This is not a majority.

The Bourne-Fuller Co. operates a blast furnace, steelworks, bar mill and bolt and nut works in Cleveland and a bolt and nut works in Unionville, Conn.

### Convention Calendar

**April 24-25—American Welding society.** Annual meeting at Engineering Societies building, New York. M. M. Kelly, 33 West Thirty-ninth street, is secretary.

**April 24-25—National Metal Trades association.** Annual convention at Drake hotel, Chicago. J. E. Nyhan, Peoples Gas building, Chicago, is secretary.

**April 29-May 3—Chamber of Commerce of the United States.** Annual meeting at Chamber of Commerce building, Washington. D. A. Skinner, 1615 H street, N. W., is secretary.

**May 1-2—Taylor society.** Spring meeting at Hotel Selwyn, Charlotte, N. C. H. S. Person, 29 West Thirty-ninth street, is managing director.

**May 1-3—American Society of Mechanical Engineers.** National management and materials handling meeting at Book-Cadillac hotel, Detroit. Calvin W. Rice, 29 West Thirty-ninth street, New York, is secretary.

**May 6-10—American Management association.** Annual spring convention at Hotel Pennsylvania, New York. W. J. Donald, 20 Vesey street, New York, is managing director.

**May 7-9—American Supply and Machinery Manufacturers' association.** Annual convention at Ambassador hotel, Atlantic City, N. J. R. Kennedy Hanson, 717 Clark building, Pittsburgh, is secretary.

**May 7-9—National Supply and Machinery Distributors' association.** Annual convention at Ambassador hotel, Atlantic City, N. J. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

**May 7-9—Southern Supply and Machinery Dealers' association.** Annual convention at Ambassador hotel, Atlantic City, N .J. Alvin M. Smith, Smith-Courtney Co., Richmond, Va., is secretary.

**May 16-17—National Hardware Association of the United States.** Eighteenth annual meeting of metal branch at Hotel Statler, Detroit. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

**May 16-18—American Gear Manufacturers' association.** Annual meeting at Hotel Statler, Cleveland. T. W. Owen, 3608 Euclid avenue, Cleveland, is secretary.

**May 21-22—American Refractories institute.** Annual meeting at French Lick Springs hotel, French Lick, Ind. Dorothy A. Texter, 2202 Oliver building, Pittsburgh, is secretary.

**May 21-23—American Steel and Heavy Hardware association.** Twentieth annual convention at Hotel Washington, Washington. B. R. Sackett, 503 Arch street, Philadelphia, is secretary.

**May 24—American Iron and Steel institute.** Annual spring meeting at Hotel Commodore, New York. E. A. S. Clarke, 75 West street, New York, is secretary.

## List Papers for British Institute Meeting

The British Iron and Steel institute will meet at the Institution of Civil Engineers, London, May 2-3, 1929. B. Talbot, managing director, Cargo Fleet Iron Co. Ltd., president of the institute, will open the meeting, and will be succeeded by Prof. Henry Louis, president-elect. The Bessemer gold medal will be presented to Sir Charles Parsons and the Carnegie medal to Dr. Arthur Bramley.

The following papers will be presented:

"Third Report on Heterogeneity of Steel Ingots," by a committee of the institute.
"First Report on Blast Furnace Plant and Practice," by a committee of the institute.
"Brittleness in Mild Steel," by G. R. Bolsover.
"Erosion of Guns," by R. H. Greaves, H. H. Abram and S. H. Rees.
"Mechanical and Metallurgical Properties of Spring Steels as Revealed by Laboratory Tests," by G. A. Hankins and Miss G. W. Ford.
"Differential Method for Measuring the Thickness of Hard Cases Without Sectioning Them," by E. G. Herbert and P. Whitaker.
"Transformation of Austenite Into Martensite in a 0.8 Per Cent Carbon Steel," by Dartrey Lewis.
"Twenty Months' Results of Dry Blast Operation," by E. H. Lewis.
"Constitutional Diagrams for Cast Iron and Quenched Steels," by A. L. Norbury.
"A New Method for the Production of Sound Steel," by Sir Charles Parsons and H. M. Duncan.
"Oxidation of Iron and Steel at High Temperatures," by L. B. Pfeil.
"Microstructure of Rapidly Cooled Steel," by J. M. Robertson.
"A Method of the Estimation of Hydrogen in Steel," by T. E. Rooney and G. Barr.
"The A. I. B. Sinter Plant at Messrs. Guest, Keen and Nettlefolds Ltd., Cardiff Works," by W. E. Simons.
"Influence of Pickling Operations on the Properties of Steel," by H. Sutton.

This year the British Iron and Steel institute celebrates its Diamond Jubilee, having been established Feb. 25, 1869.

It is announced that the autumn meeting will be held at Newcastle-on-Tyne, Sept. 10-13. Visits will be made to the North-East Coast Exhibition, and sessions of the meeting will be held in the Festival hall of the exhibition.

## May Add Open Hearths

Pittsburgh, April 16.—Apollo Steel Co., Apollo, Pa., sheet manufacturer, plans to erect a steelmaking plant on a 150-acre tract near its finishing mills, to include four to six open-hearth furnaces.

The Apollo company operates ten sheet mills, two jobbing mills and six galvanizing pots and has an annual capacity of 125,000 tons of blue annealed, black and galvanized sheets. A. M. Oppenheimer is president and general manager.

Interstate commerce commission has sustained the freight rate on scrap iron from Perryville, Mo., to East St. Louis, Ill.

# Obituaries

PHILIP COLEMAN, 64, at one time president of the Worthington Pump & Machinery Corp., New York, died April 13 in Washington. At the time of his death he was president of the Mt. Hope Bridge Co., which is constructing a $4,000,000 bridge across Narrangansett bay. He also was president of the Sandusky Bay Bridge Co. and at various times during his business career he was secretary and treasurer of the Singer Sewing Machine Co., president of the International Motor Co., assistant general superintendent of the Lehigh Valley railroad and purchasing agent and assistant to the president of the Bethlehem Steel Co. He was a native of Baltimore and was graduated from Lehigh university in 1888.

* * *

John W. Jones, president and treasurer of the Mohr-Jones Hardware Co., Racine, Wis., died recently.

* * *

Harry Townsend, foundry superintendent of the Chain-Belt Co., Milwaukee, died April 10 at Chicago.

* * *

John H. Casanave, 56, founder and president of the Casanave Supply Co., Philadelphia, dealer in engineers' supplies, died April 8 at Merion, Pa.

* * *

L. M. Shaffer, master mechanic at the Pennsylvania works, New Kensington, Pa., of the American Sheet & Tin Plate Co., Pittsburgh, died April 12.

* * *

Victor H. Oxley, 57, general manager and treasurer of the E. R. Caldwell & Co., Bradford, Pa., foundry operators, died in the Buffalo General hospital, Buffalo, recently.

* * *

Louis Quien, 77, secretary and treasurer of the New Jersey Dock & Bridge Building Co., Elizabeth, N. J., died April 10 at his home in Westfield, N. J.

* * *

Milton Farquhar, 70, inventor of the furnace manufactured by Farquhar Furnace Co., Wilmington, O., which he headed, was killed by an automobile recently in that city.

* * *

Ralph B. Kilmer, 40, vice president in charge of sales of the Pfaudler Co., Rochester, N. Y., steel tank builder, died April 5. He had been affiliated with the Chicago office of the company for several years.

* * *

Harry T. Simmons, 49, engineer in the ore and coal handling machinery division of Wellman, Seaver, Morgan Co., Cleveland, died April 10, in Cleveland. Mr. Simmons was with the Wellman interests for the past 28 years, during the period of development of modern ore and coal handling machinery.

* * *

George H. Barrus, mechanical engineer, died recently at his home in Brookline, Mass. He was born in Goshen, Mass., July 11, 1854, and received his preparatory education in the Reading, Mass., public schools and later graduated from Massachusetts Institute of Technology. He was author of a number of professional books and business paper contributions.

* * *

Arthur M. Smith, 49, secretary and treasurer of the Gas Machinery Co., Cleveland, died in New York, April 11. Mr. Smith was born in Quincy, Ill., in 1879. He attended Andover academy and Harvard university. After graduation he located in Cleveland, becoming affiliated with the Gas Machinery Co. He was made treasurer in 1901 and secretary and treasurer about a year ago.

* * *

Joseph Gehle, 49, proprietor of the National Electrotype Foundry, Cincinnati, died at his home in that city recently.

## Men of Industry

(*Concluded from Page* 1102)

man's entry into the employ of the company of which he is now the operating head.

* * *

Max L. Jeffrey, formerly works manager of the National Acme Co., Cleveland, has assumed his duties as assistant to the vice president and general manager in charge of production at the Paterson, N. J., plant of the Wright Aeronautical Corp., builder of airplane motors.

* * *

Kenneth Seaver, sales manager of the Harbison-Walker Refractories Co., Pittsburgh, and Raymond Willey, in charge of plant operations, have been elected vice presidents of the company. George G. Coolidge has been appointed assistant to the president and W. B. Coullie, formerly assistant sales manager, has been appointed general sales manager.

* * *

A. G. Pierce has been appointed manager of the Cleveland district for the Cutler-Hammer Inc., Milwaukee, manufacturer of electrical apparatus.

* * *

L. W. Brashares, after several years at the mills of the American Rolling Mill Co., Middletown, O., following his graduation from Miami university, has become identified with the sales force of that company's Cleveland office, under H. M. Richards, branch manager.

* * *

H. W. Rust, president of the Koppers Co., Pittsburgh, was elected a director of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., of the class whose terms expire in 1931.

A. W. Robertson, chairman of the board of the Westinghouse company, was elected a director of the class whose terms expire in 1932.

Directors James D. Callery, Paul D. Cravath, H. P. Davis and Harrison Nesbit, whose terms expired April 10, were re-elected for the term expiring in 1933.

## Back Proposed Standard

The sectional committee of the American Standards association on transmission chains and sprockets, under the sponsorship of the Society of Automotive Engineers, American Society of Mechanical Engineers and American Gear Manufacturers association, is circulating for criticism and approval a proposed American standard for roller chains, sprockets and cutters. If approved by the sectional committee the standard will be brought before the sponsors for formal adoption and later to the American Standards association for approval as American standard. Copies of the draft are available for loan to those interested.

## Plan Cabinet Standard

Washington, April 16.—Manufacturers, users and others interested in a simplified practice recommendation for steel bathroom and medicine cabinets have been called to a general conference here April 25 under auspices of the department of commerce.

A simplification program to be considered at the meeting includes six sizes of bodies, six sizes of wall openings and seven sizes of mirrors.

# Machinery

**Orders Taper Off as Tool Builders Are Unable to Give Prompt Deliveries—Buying of Miscellaneous Equipment Continues**

BUYING of machine tool and shop equipment is somewhat spotty with some districts doing far better than others. In New York a good miscellaneous buying persists; in Pittsburgh orders remain at the level of March and the same applies to Chicago; Cleveland and Detroit, on the other hand, are well down from the preceding months of this year. While all industry apparently is running at a high rate, machine tool selling may be throttled by the inability of builders to give prompt deliveries. The average delivery is six to eight weeks and even longer in the case of heavy production equipment. The automobile industry, while still producing cars at a high rate, is practically out of the market for shop equipment, except for replacement purposes.

**New York, April 16.**—Noted in a recent issue as contemplating the purchase of a list of machine tools, the Delaware, Lackawanna & Western railroad has entered the market for at least 30 to 40 machines. This is the largest railroad inquiry in this district in some time.

The situation otherwise is featured by a good volume of miscellaneous orders and inquiries involving one or two machines. The Intertype Co., Brooklyn, N. Y., is one of the few larger buyers, now having practically closed on most of its list of some 30 machine tools. The General Electric Co., Schenectady, N. Y., is placing scattered orders.

The Lackawanna list includes three engine lathes, two crank shapers, a hydraulic spring bending machine, four radial drills, a number of turret lathes, 90-inch quartering machine, 54-inch heavy horizontal milling machine, a sensitive drill, several grinding machines of various types, a double head bolt threading machine, a vertical drill press, pipe cutting and pipe threading machinery, a core making machine, two upsetting and forging machines, a heavy duty production lathe, a hot saw and burring machine, two 1-ton electric hoists and an electric crane truck and other miscellaneous equipment. The machinery is for various shops.

**Pittsburgh, April 16.**—Machinery sales so far this month are heavier than during the corresponding March period, although orders still are confined to a few tools at a time. The Westinghouse Electric & Mfg. Co. has started to place tools on its second quarter list. Inquiry is fairly active and in view of the volume of business now pending, continued demand is looked for over the remainder of the quarter.

The crane market is active as regards inquiry, and a good volume of business is pending. Occasional orders are being placed. The Carnegie Steel Co. has awarded a ladle crane to the Alliance Machine Co.

**Chicago, April 16.**—The volume of machine tool orders is approximating that of March, with a large total of pending orders. Buying, as for some months, is well diversified and is distributed among farm implement and tractor plants, boiler and pipe fitting manufacturers, sheet metal making plants, general machine and jobbing shops, and more recently radio manufacturers in the Chicago district have come into the market for presses and light specialty tools. Santa Fe and Burlington have placed some orders against their recent lists. The latter road has put out a new inquiry for a few miscellaneous tools. Billings are heavy. Fresh rumors of price advances are heard in some lines, but no definite announcements have been made.

**Worcester, Mass., April 16.**—While there is an absence of large lists, sales of individual equipment remain steady, covering a wide range. All machine makers have accumulated backlogs and in some instances are operating extra turns. New buying holds surprisingly well in view of the heavy commitments placed during first quarter. Automatics, lathes and precision units lead. Textiles show a slow improvement. Small tool plants are booking a steady business with consumers' stocks low. Quality used tools move well but supply is not large.

**Cleveland, April 16.**—The volume of machine tool orders in this territory shows little change from last week, the level being the lowest at any time this year. In the immediate Cleveland area, a good number of small orders are placed; outside of that district business is light. Practically nothing is coming from Detroit, indicating that the automotive industry is making no plans until a better idea of summer car buying is to be had. Inability of machinery dealers to give reasonable deliveries to customers may be serving as a deterrent in the market. On an average, deliveries from tool building factories are off six to eight weeks and in the case of heavy units, such as drills and boring mills, deliveries are still slower.

## CRANE ORDERS PLACED

50-ton locomotive crane for Baltimore & Ohio, to Industrial Brown Hoist Corp.; this railroad also is reported to have closed on four 200-ton wrecking cranes; 6-ton truck crane for Dearden Co., Springfield, Mass., to Wilamette-Ersted Co.; 3-yard ash handling crane for New York Edison Co., New York, to Maine Electric Co.; used caterpillar crane for D. M. Rosser, commissioner of Luzerne county, Wilkes-Barre, Pa., to a local seller; 25-ton electric crane for International-Great Northern, to Shaw Crane-Putnam Machine Co. Inc.

One 125-ton ladle crane with 40-ton auxiliary hoist, 60-foot span, for Mingo Junction works, Carnegie Steel Co.; to Alliance Machine Co.

## CRANE ORDERS PENDING

Ditcher crane for New York Central railroad; four locomotive cranes for Southern Railway, inquiry withdrawn and two caterpillar cranes rented; 1800-foot monorail system for Freshman Radio Co., near Passaic, N. J., bids asked.

Two 1-ton electric hoists and one electric crane truck for the Delaware, Lackawanna & Western, bids asked; as noted in a recent issue, this railroad closed on a 25-ton electric overhead crane to Shaw Crane-Putnam Machine Co. Inc.

## Metal Trades Ready for Chicago Convention

Arrangements have been completed for the thirty-third annual convention of the National Metal Trades association at Chicago, April 23-26. The first and final days will be devoted to plant visits. During the intervening period, the convention sessions will be in progress at Drake hotel. The program has been announced as follows:

**Tuesday, April 23**

Plant visitation.

**Wednesday, April 24**

MORNING

Welcome address, W. F. Winaus, president, Chicago Association of Commerce.

"The Contribution of Law to Industrial Co-operation," by Walter Gordon Merritt, counsel, League for Industrial Rights.

AFTERNOON

"How Sound Pictures Are Made," Western Electric Co. demonstration.

"Progress in the Air," by G. W. Vaughn, vice president, Wright Aeronautical Corp.

"Progress in Employe Relationships," by Dr. Harry Myers, Frigidaire Corp.

Report of committee on industrial education.

Foremanship conference demonstration.

EVENING

Annual banquet.

Address by Charles Donnelley, St. Paul, president, Northern Pacific railroad.

"Problems of Prosperity?" by Francis H. Sisson, New York, vice president, Guaranty Trust Co.

**Thursday, April 25**

MORNING

"Progress in Transportation," by Elisha Lee, vice president, Pennsylvania railroad.

"Problem and Progress in Agriculture," by Wheeler McMillen, editor *Farm and Fireside.*

Report by committee on industrial relations.

"Progress in Management," by Otto P. Geier, vice president, Cincinnati Milling Machine Co.

AFTERNOON

"How Long Will Prosperity Last?" by T. N. Carver, department of economics, Harvard university.

Report by committee on prevention of industrial accidents.

"Men and Managers under Mussolini, Marx, and Hoover," by Whiting Williams, counsel on industrial relations.

Election of officers.

**Friday, April 26**

Plant visitation.

# CONSTRUCTION and ENTERPRISE

*Concise Timely Business Building Opportunities from Field of Industry*

## North Atlantic

BLOOMINGTON, ILL.—Williams Oil-O-Matic Heating Corp. has awarded the contract for 2 plant additions, 100 x 200, and 125 x 200 feet, to J. L. Simmons, 917 East Oakland street.

CHICAGO—Kay-El Mfg. Co., 3830 North Kilbourne street, plans to construct a 1-story and basement addition, 50 x 150 feet. Vittner & Co., 3985 Milwaukee avenue, architects.

CHICAGO, ILL.—W. Q. Jones Foundry & Machine Co., 4401 West Roosevelt road, plans to start construction soon on a 2-story and basement plant addition. Weiss & Neistedt, 53 West Jackson boulevard, are architects.

CICERO, ILL.—A tract at 5443 West Roosevelt road has been acquired by hte Empire Metal Products Co. A factory building on the plot is being remodeled for occupany by the Empire company, a new organization which will specialize in galvanizing products.

EAST MOLINE, ILL.—E. & T. Fairbanks Co. has awarded the contract for a 1-story plant addition, 116 x 139 feet, to Greenleaf Construction Co., 1706½ Second avenue, Rock Island, Ill.

EAST ST. LOUIS, ILL.—East Side Levee and Sanitary district, 213 Metropolitan building, has awarded the contract for the construction of two pumping stations, and four 54-inch and two 36-inch screw pumps to H. H. Hall Construction Co., Murphy building.

ELKHART, IND.—Service Welding Works, 2636 South Main street, has been established by Jay A. Warstler and W. F. Norwood and will do structural steel welding, tank construction work, etc. The company has leased a plant at the above address and is expected to be in operation by the middle of the month.

EVANSVILLE, IND.—William F. Hartig Plow Co. plans to build a plant addition which will increase production 50 per cent.

INDIANA HARBOR, IND.—Inland Steel Co. has awarded the contract for structural steel for a plant extension to McClintic-Marshall Co. (Noted March 14.)

INDIANAPOLIS—W. D. Allison Co., 905 North Alabama street, plans construction of new power plant in connection with factory for manufacture of physicians' furniture.

KNIGHTSTOWN, IND.—Board of trustees, Indiana Soldiers and Sailors Orphans' home, is having plans drawn for a power house at the institution. McGuire & Shook, 941 North Meridian street, Indianapolis, are architects.

LA PORTE, IND.—Columbia Metal Products Co., Chicago, will locate here and start operations May 1. (Noted March 28.)

MUNCIE, IND.—Moore Co. has awarded the contract for a 1-story plant addition, 80 x 150 feet, to E. G. Jarrell, 401 East Adams street.

MUNCIE, IND.—Moore Mfg. Co., Nichols avenue, manufacturer of beds and bed springs, plans the construction of a new plant unit, 2-story, 100 x 102 feet.

DETROIT—Detroit Edison Co. has awarded the structural steel contract for a substation to McClintic-Marshall Co.

DETROIT—Michigan Smelting & Refining Co. has awarded the general contract for the construction of a manufacturing plant to Kriegshoff Co., Christian W. Brandt is architect.

DETROIT—Detroit Sheet Metal Works has awarded the general contract for the construction of a plant to John H. Reniger. (Noted March 21.)

DETROIT—Burroughs Adding Machine Co. has let the contract for the construction of a plant to be erected at Brooklyn and Stanley avenues to R. S. Knapp Co. Albert Kahn is architect.

DETROIT—Bohn Aluminum & Brass Corp. has plans for the construction of a new aluminum extrusion plant, extending its plant No. 5, at 7880 Campeau avenue. The plant will be 120 x 300 feet.

DETROIT—Majestic Tool & Mfg. Co., 2650 Poplar street, incorporated recently, advises that it plans the manufacture of ball bearings, grinding spindles, bench grinders, etc., and is now installing equipment. The plant will open May 1. (Noted March 28.)

JACKSON, MICH.—Contract for the construction of a plant addition for the Sparks-Withington Co. here has been awarded to Boldt Construction Co., 1969 East Seventieth street, Cleveland.

CINCINNATI—Crosley Radio Corp. has acquired a large tract adjoining its present holdings and contemplates the construction of a new building to be used for loading and as a final assembly department. The area comprises 200,000 square feet.

CLEVELAND—John Carroll university, West Thirtieth street, plans the construction of a power plant.

DAYTON, O.—National Cash Register Co. has awarded the contract for structural steel for a plant addition to Dayton Structural Steel Co. (Noted Feb. 21.)

DELTA, OHIO—Markey Bronze Bushing Co. is completing an addition giving it 2590 square feet additional floor space, largely for offices, tool room, etc. This will release present floor space for additional foundry and machine equipment.

HAMILTON, O.—Estate Stove Co. plans the construction of a foundry addition and pattern shop to its East avenue plants.

NILES, O.—Kalman Steel Co., Chicago, has work under way on a plant addition, 80 x 140 feet here ground having been broken recently. The addition is expected to be completed June 1.

TOLEDO, O.—Toledo Scale Co. has purchased an 80-acre site for the construction of a new plant.

MOUNDSVILLE, W. VA.—City council con-

## Resale Equipment News

NAVY surplus and surveyed material will be sold at public auction at the navy yard at Norfolk, Va., May 2. In the material are included: 1,414,730 pounds of ferrous metals, 197,600 pounds of nonferrous metals, 32,000 pounds of rope and wire, machine tools, radio material, boat and ship fittings, drills, engines, automobile parts, electrical material, pumps, tubing, drums and small boats.

* * *

Stringer Bros. Co. Inc., Gadsden, Ala., is offering a foundry and machine shop plant for sale because of combining two plants in one, rendering the other superfluous.

* * *

Sale of the Marine City Motor Casting Co., Marine City, Mich., has been confirmed by the trustees in bankruptcy. Central Trust Co., Detroit, represents the buyers, who plan to operate it as a foundry.

* * *

Bankrupt auction of the Walker Stewart foundry at Plantsville, Conn., will be held April 23. The sale will include raw and finished material, molds, castings, machinery and office furniture and fixtures. Joseph G. Woods is trustee.

### Sales Calendar

*April 18.—Land, buildings, machinery, etc., of Sykes Co. Inc., Logansport, Ind., to be sold at public auction.*

*April 23—Bankrupt sale at auction of Walker Stewart foundry, Plantsville, Conn.*

*May 2—Auction of metals and other navy surplus at navy yard, Norfolk. Va.*

templates the erection of a municipal electric plant and has started investigations of details of construction and operation.

ARGYLE, WIS.—This city, Francis Muenich clerk, has voted in favor of a $20,000 bond issue for improving and enlarging the municipal hydroelectric generating plant and changing the present 220-volt direct current system to 110-volt alternating current.

KENOSHA, WIS.—Board of vocational education has accepted the bid of Pehrson Bros., Minneapolis, for the general contract for building the new Lincoln Junior high school at $406,225. The total of contracts awarded exceeds $600,000.

KENOSHA, WIS.—W. E. O'Brien, city manager, has closed bids for furnishing the city water department one engine-driven, low lift centrifugal pump with a capacity of 12,000,000 gallons daily. It will be used in the new filtration plant now under construction. Engineers are Alvord, Burdick & Howson, Chicago.

MADISON, WIS.—Crane Co., Chicago, is preparing to build a new warehouse, display room and service shop costing about $50,000. Leased quarters at 521 Williamson street are now occupied. O. G. Stavoe is branch manager.

MILWAUKEE—Kohver Pattern Co., 1467 Holton street, manufacturer of wood and metal patterns, templates, etc., has awarded contracts for a 1-story addition, 50 x 104 feet.

NEW LONDON, WIS.—Edison Wood Products Co. Inc., a division of the Edison phonograph and radio interests, for which it manufactures cabinets, is building a 3-story factory addition, 50 x 150 feet.

# East Central

BALTIMORE—Western Electric Co. has awarded the structural steel contract for the construction of a cable plant to McClintic-Marshall Co. through H. K. Ferguson Co.

BALTIMORE—Glenn L. Martin Co. has awarded the contract for the construction of the first unit of its airplane manufacturing plant to Hughes-Foulkrod Co., Philadelphia. The unit is expected to be ready for occupancy by Aug. 1. (Noted March 28.)

HAGERSTOWN, MD.—Fairchild Aviation Corp., 270 West Thirty-eighth street, New York, has acquired an interest in Kreider-Reisner Aircraft Co. and plans the construction of a new plant here.

BRIDGEWATER, MASS.—Massachusetts board of education, State House, has awarded the contract for a power plant at State normal school to F. Losardo, 35 George street, Hyde Park. (Noted Oct. 4.)

WEYMOUTH, MASS.—Edison Electric Illuminating Co., 39 Boylston street, Boston, plans the construction of a transmitting station.

WOBURN, MASS.—Edison Electric Illuminating Co., 39 Boylston street, Boston, plans to build an electric substation here.

ELIZABETH, N. J.—Elizabethtown Water Co., 64 Broad street, soon will award the contract for the construction of a pumping station.

TRENTON, N. J.—Trenton Potteries Co. plans installation of power equipment, mechanical drying apparatus, etc., in proposed 5-story addition to sanitay plant.

BUFFALO—Board of trustee, Emergency hospital, Sisters of Charity, 669 Main street, contemplates the construction of a power plant addition.

BUFFALO—G. Elias & Bro. Inc. will erect a new plant on an eight acre site adjoining the Buffalo airport. The new plant will be used for the production of airplane engines.

NEW YORK—Lehigh Valley railroad announces plans for a new terminal warehouse in New York, to be operated by Lehigh Valley Terminal Warehouse Inc. Building is to be erected on Hudson river between Twenty-sixth and Twenty-seventh streets.

ROCHESTER, N. Y.—Department of ways and means, Albany, has appropriated money for the construction of a power house at Rochester State hospital here.

WATERVILLE, N. Y.—George W. Haxton & Son, Oakfield, N. Y., plans the installation of power equipment in connection with improvements and extensions in their food canning plant here.

PHILADELPHIA—Lewis Jones Inc., Sixty-fourth and Lebanon streets, plans the construction of a 2-story addition to its boiler house.

PHILADELPHIA—Reyburn Mfg. Co., Thirty-second street and Allegheny avenue, plans the installation of power equipment in its 5-story paper products plant addition.

PHILADELPHIA—Publicker Commercial Alcohol Co., Bigler street and Delaware avenue, plans extensions and improvements to its steam power house.

PHILADELPHIA—Structural steel for a power house for the A. Atwater Kent Mfg. Co., Wissa avenue and Abbotsford road, has been awarded to Shoemaker Bridge Co. (Noted April 11.)

PITTSBURGH—Duquesne Light Co. has awarded the contract for structural steel for a power station to American Bridge Co. through Byllesby Engineering & Management Corp., Chicago.

SANDT'S EDDY, PA.—Lehigh Portland Cement Co. will enlarge plant at Sandt's Eddy, Pa., to double its capacity. Edison Portland Cement Co. is completing several new mills on opposite of Delaware river to those of the Lehigh Portland Cement Co.

# Western States

LOS ANGELES—Emsco Airplane Co. has let the contract for structural steel for a plant to Consolidated Steel Corp.

LOS ANGELES—Willard Storage Battery Co., East 131st street, Cleveland, plans installation of power equipment in its proposed plant at South Gate.

SILVER CITY, N. M.—City council has authorized an immediate call for bids for a municipal water supply system, including motor-driven pumping equipment, air compressor and other mechanical equipment. Burton G. Dwyre, Silver City, is engineer.

WAGONER, OREG.—City of Wagoner plans to vote on $76,500 bonds for waterworks improvements, including a filter plant, pumping equipment, etc.

RICHFIELD, UTAH—Telluride Power Co., Provo, Utah, plans the construction of a steam-operated electric power plant in Sevier valley, near Richfield, including power equipment.

PALOUSE, WASH.—Power equipment will be installed in the proposed new pulp mill to be built by A. L. Maxwell, here.

SPOKANE, WASH.—L. P. Larsen, Spokane, president of the Pend Oreille Lead-Zinc Co. at Metaline, announces that a $5,000,000 concentrator and zinc plant will be built.

TACOMA, WASH—Tacoma Railway & Power Co. plans track improvements and addition of new equipment, following reorganization announced recently.

# Southern States

BLUE RIDGE, GA.—Toccoa Electric Power Co., subsidiary of the Tennessee Electric Power Co., 540 Market street, Chattanooga, Tenn., has awarded the general contract for the construction of a 20,000-horsepower hydroelectric power plant and dam on Toccoa river, to Stevens & Wood, 20 Pine street, New York.

LOUISVILLE, KY.—Louisville Electrical Mfg. Co. plans the erection of a plant addition at 3100 Magazine street.

NEW ORLEANS—American Can Co., 602 North Cortez street, plans the construction of an addition to its plant, 88 x 220 feet.

WINSTON SALEM, N. C.—Reynolds Aviation of North Carolina Inc., George W. Orr manager, Realty building, plans to move the equipment

of Reynolds Co. from Curtiss Field, N. Y., to municipal airport where hangars and shops will be erected.

MIAMI, OKLA.—Canam Metals Inc., which recently acquired several lead and zinc producing properties in Oklahoma and Kansas, has taken option on the Crystal Mineral Trust Co. mine west of Cardin with view of purchase. Improvements are planned on other properties recently acquired.

TULSA, OKLA—Construction has started on plant of Jansen-Jenkins Co., manufacturer of kitchen and restaurant equipment, to be erected at 1209 South Frankfort.

TULSA, OKLA.—Foxboro Co., Foxboro, Mass., manufacturer of gages, controllers, etc., plans the construction of a manufacturing and distributing plant at 28 North Guthrie street.

SPARTANSBURG, S. C.—Fairforest Finishing Co. plans the installation of power equipment in its textile bleaching plant on North Tyger street.

ALCOA, TENN.—Aluminum Co. of America has let the structural steel contract for an extension to a plant to Converse Bridge & Steel Co.

MEMPHIS, TENN.—Gardner & Howe, local engineers, have prepared plans for warehouse addition, 125 x 430 feet, for Jones & Laughlin Steel Corp., Pittsburgh, at the foot of Auction avenue. Crane equipment for loading and unloading river barges will also be installed. Plans call for completion in 60 days.

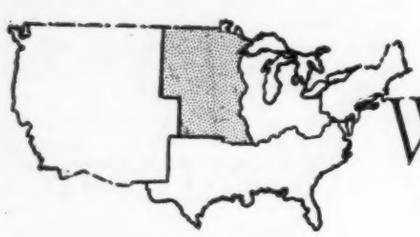
NASHVILLE, TENN.—Southern Textile Machinery Co., Second and Norton streets, Paducah, Tenn., plans the construction of a plant.

BIG SPRING, TEX.—Texas & Pacific railroad, E. F. Mitchell chief engineer, Dallas, Tex., plans the construction of an engine house and repair shops and other units.

HOUSTON, TEX.—Houston Armature Works, 4 Preston street, has plans for a new shop building and other improvements, including removal to a new site. A. C. Kater is president.

LOZANO, TEX.—Lozano Cold Storage Ice & Power Co. plans the construction of an ice and power plant.

SCHULENBURG, TEX.—Carnation Milk Products Co., Oconomowoc, Wis., plans the installation of power equipment in its milk condensing plant here.



## West Central

WICHITA, KANS.—W. S. Henrion Construction Co. has been awarded the contract for the construction of the new Cessna Aircraft Co. plant, on the recently acquired airport southeast of the city.

NORTH KANSAS CITY, MO.—R. W. Yates Laundry Machinery Co., Tenth and Fayette streets, plans to double the size of its plant.

ST. JOSEPH, MO.—Bird Wing Commercial Aircraft Co., Carl H. Wolfley, vice president, plans the erection of an additional plant on property adjoining the city airport.

ST. LOUIS—Wright Aeronautical Corp., Paterson, N. J., will install power equipment in its proposed branch plant at St. Louis. (Noted March 28.)

ST. LOUIS—C. W. Burst, president, Moon Motor Car Co. and the Windsor Corp., St. Louis, announced the closing of a contract to manufacture a cotton picking machine.

ST. LOUIS—St. Louis & San Francisco railroad announces the addition of a 12-stall roundhouse, bringing the number of stalls up to forty. All heavy repairs at the St. Louis end of the company's River and Eastern divisions will be handled at this location. (Noted April 11.)

ST. LOUIS—Philip Gruner & Bros. Lumber Co., R. E. Gruner president, will open a barge and boat yard on the Mississippi river at St. Louis. It will be fully equipped for building wooden and metal barges and certain types of boats. Repair ways for all sizes of river craft will be added.

LINCOLN, NEBR.—The board of trustee, University of Nebraska, is said to have plans maturing for a new steam power plant with equipment. Davis & Wilson, 525 South Thirteenth street, are architects.

FARGO, N. DAK.—Northern States Power Co. plans the construction of a large new power plant, probably to be built within the next year. Improvements are now under way at the electric and gas plants here. J. F. McGuire is manager of the Fargo office of the company.

PHILIP, S. DAK.—Paul S. Kerfoot, Public Utilities Co., Pioneer building, St. Paul, plans power plant extensions and improvements here, including additional equipment.

## Canada

OTTAWA, ONT.—Plans for a $65,000,000 power development by the Beauharnois Light, Heat & Power Co. have been approved by the Canadian government. The development will be on the St. Lawrence river and will involve the digging of a canal 14 miles in length between Lake St. Francis and Lake St. Louis. A power plant will be erected near Melocheville, about 25 miles from Montreal.

MONTREAL, QUE.—A number of contracts have been awarded by the Johnston Wire Works, Dagenais street, in connection with its plant addition. John McGregor Ltd., 1410 Stanley street, has general contract, and the Canadian Vickers Ltd., Maisonneuve, the structural steel contract. Architects are R. Pringle & Son, Ltd.

REGINA, SASK.—Hutton & Souter, Hamilton, Ont., are receiving bids for the erection of a part and service plant here for the General Motors Co. of Canada Ltd., Oshawa, Ont. Plans are nearing completion.

## Recent Incorporations

CHICAGO—Central States Engineering Co. Inc., 200 West Wacker drive, has been incorporated with $5000 capital to manufacture and deal in all kinds of tools and machinery by D. J. Ward.

CHICAGO—Barrel Fitting & Steel Corp. of America, 919 South Keeler avenue, has been incorporated with $100,000 in preferred shares and 100,000 shares no par value stock to manufacture and deal in barrel products, bushings, etc., by W. M. Bering.

CHICAGO—Ever Sharp Die Tool & Repair Co., 5430 West Chicago avenue, has been incorporated with $10,000 capital to repair, renovate and deal in tools, dies, etc., by Henry Osterman.

CHICAGO—Turo Metals Corp., Railway Exchange building, 80 East Jackson boulevard, has been incorporated to manufacture and deal in iron, steel and metal products, by Jerome Morris.

CHICAGO—Mid City Architectural Iron Co., 409 South Hoyne avenue, has been incorporated with $10,000 capital to manufacture and deal in iron, steel and other metal products, by Louis Needleman.

ST. LOUIS—Allegheny Tube & Steel Co., 1308 North Main street, L. A. Crancer president, has been incorporated to manufacture pipe couplings, nipples and plugs with $25,000 capital.

BOSTON—Waldo Bros. Co. has been incorporated with 27,600 shares with no par value, 5100 shares are preferred and 22,500 shares are common stock, to manufacture, and deal in iron, steel and other metals, hardware, tools, machinery and railroad supplies, etc. John Wray, treasurer, Winchester, Mass.

REDBANK, N. J.—Seacoast Iron Works Inc. has been incorporated with $125,000 capital by Tumen & Tumen, Asbury Park, attorneys.

PERTH AMBOY, N. J.—Simmen Hydraulic Jack Corp. has been incorporated with $125,000 capital by Thomas L. Hanson, Perth Amboy, attorney.

NEW YORK—Equitable Metal Products has been incorporated with 200 shares no par value stock by M. B. Hillman, 150 Nassau street.

NEW YORK—Cosmo Metal Alloys Corp. has been incorporated with $3000 capital by Basch & Kulkin, 1265 Broadway, attorneys.

NEW YORK—Hirschen Metal Works has been incorporated with $15,000 capital by B. Kronenberg, 302 Broadway, attorney.

SALISBURY, N. C.—Salisbury Electric Repair Co. has been incorporated with $50,000 capital by E. L. Wingate and Jack J. Jordan.

ZANESVILLE, O.—Zanesville Tool & Supply

Co. has been incorporated with 500 shares no par value stock by J. Lincoln Knapp, Charles S. Leasure and C. A. Maxwell.

MIAMI, OKLA.—Miami Air Motor Co. has been organized by H. C. Shamblin, president, J. B. Harper and Harry T. Arendale to manufacture and distribute a compressed air motor.

MAUD, OKLA.—National Machine & Tool Co. has been incorporated with $50,000 capital by R. W. Willis, president and manager, J. F. Conway and S. A. Boorstin to manufacture and repair oil tools.

OKLAHOMA CITY, OKLA.—Durametallic Packing Co. has been incorporated with $10,000 capital by T. P. Curley, A. A. Gallman and others.

TULSA, OKLA.—Shot Barrel Co., capital $25,000, has been incorporated by Edward B. Rich, 2216 North Main street, O. H. Searcy and George W. Reed Jr., to manufacture oil field specialties.

LUTZVILLE, PA.—Kennedy Mfg. Co. has been incorporated with $8000 capital to manufacture and deal in metal products, etc., by G. R. Lutz.

PHILADELPHIA—Metal Engineering & Welding Co. has been incorporated with $15,000 capital to manufacture and deal in metal and alloy articles, etc., by George R. Fisher, 7235 Ogontz avenue.

SCRANTON, PA.—Interchangeable Locomotive Rod Co. has been incorporated with $5000 capital to manufacture and deal in interchangeable locomotive rods, etc., by Charles E. Weidow, 916 Gibson street.

LEBANON, PA.—Kohnson-Farmer Chain Co. has been incorporated with $50,000 capital to manufacture iron and steel chain and similar products by Arthur Farmer, 133 Cumberland street.

PITTSBURGH—Howard & Collingwood Inc. has been incorporated with $100,000 capital to manufacture, sharpen and deal in tools for machine and butcher trade, etc., by Allen K. Collingwood, 405 South Braddock avenue.

PHILADELPHIA—Pedrick Tool & Machine Co. has been incorporated with $60,000 capital to manufacture and deal in machinery, machine tools, etc., by Albert D. Pedrick, 312 Penarth road, Bala, Pa.

PHILADELPHIA—Hopkins-Tull Machinery Co. has been incorporated with 1000 shares no par value stock to manufacture and deal in machinery, devices, etc., by Alfred Hopkins, 7054 North Twentieth street.

PHILADELPHIA—National Perforator Co. Inc. has been incorporated with $5000 capital to manufacture and deal in machinery, appliances, etc., by Raymond M. Hessert, 710 Bringhurst avenue, Audubon, N. J.

SOMERTON, PA.—Foster-Hirst Inc. has been incorporated with $45,000 capital to manufacture and deal in heating apparatus, etc., by Elwood B. Foster, Somerton.

FORT WORTH, TEX.—Wood-Keetch Metal Mfg. Co. has been incorporated with $12,500 capital by E. O. Wood, 240 West Thirteenth street, L. L. Wood and C. A. Keetch to manufacture sheet metal products.

HOUSTON, TEX.—McMillan Machinery Co. has been chartered with $50,000 capital by W. E. McMillan to handle a general line of contractor's equipment and industrial machinery.

PLAINVIEW, TEX.—West Texas Tractor & Machinery Co., capital $75,000, has been incorporated by J. Lee Jackson, J. M. Moroney and L. L. McSpadden to deal in farm machinery and heavy hardware.

WAUSAU, WIS.—Unit Heater & Cooler Co. has been incorporated with $25,000 capital to manufacture heaters, stoves, furnaces, refrigerating devices, etc., by E. M. Bassler, John F. Ross and G. B. Heinemann, 916 Fulton street.

GALESVILLE, WIS.—Arnold Dryer Co. has been incorporated to manufacture special machinery, tools, etc., by Gerald D. Arnold, Henry C. French and Guilford M. Wiley.

GREEN BAY, WIS.—Weissmiller, Armstrong, Geniesse Co. has been incorporated with $30,000 capital to manufacture sheet metal products, roofing, furnaces, etc., by Edward Weissmiller, John Armstrong and Ben Geniesse, 629 South Roosevelt street.

EDMONTON, ALTA.—Douglas Hammill Ltd. has been incorporated to take over the business of the Metal Specialty Co. and manufacture and deal in metal products with $50,000 capital by Ralph H. Douglas, Alden Hammill, Roy A. Douglas, all of Edmonton.

VANCOUVER, B. C.—Bagan Rotary Plows Co. Ltd. has been incorporated to manufacture harvest machinery, motors, engines, etc., with $1,000,000 capital by John P. Bagan, George A. Morrison, John S. Lane, all of Vancouver.

STRATFORD, ONT.—Refrigerating Equipment Ltd. has been incorporated to manufacture and deal in refrigerating dairy and cheese making machinery, with 100,000 shares no par value stock by Charles W. Stillman, and Robert W. Stillman, both of Stratford, and Charles E. Richardson of St. Marys.

TORONTO, ONT.—Skyway Ltd. has been incorporated to manufacture and deal in airplanes, hydroplanes and other mechanical devices with $100,000 capital and 200 shares no par value stock by James P. Manley, Hugh E. Fleming, Emery E. Lothrop, and others all of Toronto.

TORONTO, ONT.—T. B. Smyth & Co. Ltd. has been incorporated to carry on the business of plumber and steamfitter and manufacturers of plumber supplies, with $50,000 capital by Richard Huffman, Richard C. Hughes, William Doherty and others, all of Toronto.

MONTREAL, QUE.—Louis Holzman Ltd. has been incorporated to manufacture and deal in electrical and radio parts and appliances with $20,000 capital by Louis Holzman, London, England; Marcus Holzman and Zipporah Schneider of Montreal.

# New Trade Publications

AIR TOOLS—Rotor Air Tool Co., Cleveland, has issued a folder showing improvements recently made in its line.

MAGNETIC SEPARATORS—Magnetic Mfg. Co., Milwaukee, has prepared a bulletin on its magnetic separating equipment for the concentration of ores and minerals. It presents theoretical and practical experience.

STEEL CASTINGS—Nugent Steel Castings Co., Chicago, discusses in a current bulletin the large tonnage of new material required to produce a ton of steel castings and the care used to obtain quality.

PROTECTIVE COATINGS—American Wurtzilite Co., Chicago, is distributing a leaflet describing its paints, coatings and binders for protective industrial uses. They are used for waterproofing, acid and alkaliproofing, heat resisting dielectric and adhesive purposes.

ELECTRIC FURNACE—Ajax Electrothermic Corp., Trenton, N. J., has issued a bulletin on its electric furnaces. It explains the principle of induction by which materials are heated without electrodes and thus avoid the use of carbon. Halftones and diagrams illustrate the furnaces and the principles of its operation.

CONCRETE REINFORCING—Consolidated Expanded Metal Companies, Wheeling, W. Va., explains in a current bulletin the use of its reinforcement in concrete floors laid on the ground. The question of need for reinforcement in floors laid on the ground is discussed and the type of reinforcement produced by the company is illustrated.

PORTABLE POWER UNITS—Century Electric Co., St. Louis, in a current bulletin features a portable power unit designed for use on farms for supplying power at needed points. They are built in 3, 5 and 7½-horsepower sizes, for operation on current delivered by any power company. Illustrations show construction and method of use.

UNDERFEED STOKER—Combustion Corp., New York, is distributing a catalog of its underfeed stoker, center retort, for boilers up to 200 horsepower. It gives operators of small boilers the advantages of mechanical stoking at low investment cost. Diagrams and cross sections cover details of its construction and the text explains fully its operation and advantages.

ELECTRICAL ACCESSORIES—General Electric Co., Schenectady, N. Y., has issued several bulletins, including the following: Helicoil sheath-wire resistor units for use with cable-reel motors, where other types of resistors could not be used, for lack of space; adjustable varying-speed motors with speed adjustment by brush shifting; heating equipment for hot-galvanizing tanks; insulating material for railway and industrial haulage apparatus. All are illustrated.

ENGINES—Chicago Pneumatic Tool Co., 6 East Forty-fourth street, New York, has issued a 23-page bulletin on its diesel engines. The bulletin contains a general description of the engine, details of construction, and is illustrated with reproductions from photographs of typical installations, illustrations of the various parts and phantom and working drawings. The feature of the bulletin is the chart showing the cost of fuel, at various prices per gallon, for different sized engines operating at various loads.

# Pipe and Tube Prices—Plate Extras

## Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

**Butt Weld**

| | Black | Galvanized |
|---|---|---|
| ⅛-inch | 45 | 19½ |
| ¼ and ⅜-inch | 51 | 25½ |
| ½-inch | 56 | 42½ |
| ¾-inch | 60 | 48½ |
| 1 to 3-inch | 62 | 50½ |

**Lap Weld**

| | | |
|---|---|---|
| 2-inch | 55 | 43½ |
| 2½ to 6-inch | 59 | 47½ |
| 7 to 8-inch | 56 | 43½ |
| 9 and 10-inch | 54 | 41½ |
| 11 and 12-inch | 53 | 40½ |

**REAMED AND DRIFTED**

**Butt Weld**

| | | |
|---|---|---|
| 1 to 3-inch | 60 | 48½ |

**Lap Weld**

| | | |
|---|---|---|
| 2-inch | 53 | 41½ |
| 2½ to 6-inch | 57 | 45½ |

**EXTRA STRONG—PLAIN ENDS**

**Butt Weld**

| | | |
|---|---|---|
| ⅛-inch | 41 | 24½ |
| ¼ and ⅜-inch | 47 | 30½ |
| ½-inch | 53 | 42½ |
| ¾-inch | 58 | 47½ |
| 1 to 1½-inch | 60 | 49½ |
| 2 to 3-inch | 61 | 50½ |

**Lap Weld**

| | | |
|---|---|---|
| 2-inch | 53 | 42½ |
| 2½ to 4-inch | 57 | 46½ |
| 4½ to 6-inch | 56 | 45½ |
| 7 to 8-inch | 52 | 39½ |
| 9 and 10-inch | 45 | 32½ |
| 11 and 12-inch | 44 | 31½ |

**DOUBLE EXTRA STRONG**

**Butt Weld**

| | | |
|---|---|---|
| ½-inch | 42 | 32½ |
| ¾ to 1½-inch | 45 | 35½ |
| 2 to 2½-inch | 47 | 37½ |

**Lap Weld**

To large jobbers these discounts are increased on black by 1 point and a supplementary discount of 5 per cent; on galvanized by 1½ points with a supplementary 5 per cent. Extra 5 per cent granted in the 4th quarter 1927 and 1st quarter 1928 discontinued April 2, 1928.

## Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

**THREADS AND COUPLING**

**Butt Weld**

| | Black | Galv. |
|---|---|---|
| ¼ and ⅜-inch | +11 | +36 |
| ½-inch | 23 | 5 |
| ¾-inch | 28 | 11 |
| 1 and 1¼-inch | 31 | 15 |
| 1½ and 2-inch | 35 | 18 |

**Lap Weld**

| | | |
|---|---|---|
| 1¼ and 1½-inch | Upon application | |
| 2-inch | 23 | 9 |
| 2½ to 3½-inch | 28 | 12 |
| 4 to 6-inch | 30 | 17 |
| 7 and 8-inch | 29 | 16 |
| 9 to 12-inch | 26 | 11 |

**REAMED AND DRIFTED**

**2-inch to 6-inch—Two points less than above**

**EXTRA STRONG, PLAIN ENDS**

| | | |
|---|---|---|
| ¼ and ⅜-inch | +13 | +48 |
| ½-inch | 23 | 7 |
| ¾-inch | 28 | 12 |
| 1 to 2-inch | 34 | 18 |

**Lap Weld**

| | | |
|---|---|---|
| 2-inch | 29 | 13 |
| 2½ to 4-inch | 34 | 20 |
| 4½ to 6-inch | 33 | 19 |
| 7 and 8-inch | 31 | 17 |
| 9 to 12-inch | 21 | 8 |

**DOUBLE EXTRA STRONG**

**Butt Weld**

| | | |
|---|---|---|
| ½-inch | +47½ | +59½ |
| ¾-inch | +28 | +40 |
| 1-inch | +34 | +46 |
| 1¼-inch | +28 | +40 |
| 1½-inch | +27 | +39 |

**Lap Weld**

| | | |
|---|---|---|
| 2 and 2½-inch | +13 | +25 |
| 3 to 4-inch | + 8 | +17 |
| 4½ to 6-inch | + 9 | +18 |
| 8-inch | +12 | ..... |

Large jobbers obtain additional discount of 1 point with supplementary discounts of 6 and 2½ per cent on black and galvanized.

On extra or double extra strong pipe fitted with threads and couplings basing discount lowered 5 points from plain end price. Fitted with threads only, basing discount lowered 3 points for random lengths.

## Boiler Tubes

**Pittsburgh carload discounts**

**STEEL (Lap Weld)**

| | |
|---|---|
| 2 and 2¼-inch | 40 off |
| 2½ and 2¾-inch | 48 off |
| 3-inch | 54 off |
| 3¼ to 3¾-inch | 56 off |
| 4-inch | 59 off |
| 4½ to 6-inch | 48 off |

Subject to two 5 per cent discounts on full carload shipments. On less than 10,000 pounds, base discount reduced 6 points and one 5 per cent allowed. On 10,000 pounds to carload, base discount reduced 4 points and two 5 per cents allowed.

**CHARCOAL IRON**

| | |
|---|---|
| 1½-inch | 1 off |
| 1¾-inch | 8 off |
| 2 and 2¼-inch | 13 off |
| 2½ and 2¾-inch | 16 off |
| 3-inch | 17 off |
| 3¾ to 3½-inch | 18 off |
| 4-inch | 20 off |
| 4½-inch | 21 off |

Subject to 10 per cent discount on full carload lots. On less than 10,000 pounds, base discount reduced 2 points and no preferential allowed. On 10,000 pounds to carload, 5 per cent preferential allowed.

**SEAMLESS COLD DRAWN**

| | |
|---|---|
| 1-inch | 63 off |
| 1¼ and 1½-inch | 55 off |
| 1¾-inch | 39 off |
| 2 and 2¼-inch | 34 off |
| 2½ and 2¾-inch | 42 off |
| 3-inch | 48 off |
| 3¼ and 3½-inch | 50 off |
| 4-inch | 53 off |
| 4½, 5 and 6-inch | 42 off |

**SEAMLESS HOT ROLLED**

| | |
|---|---|
| 1¾-inch | 39 off |
| 2 and 2¼-inch | 40 off |
| 2½ and 2¾-inch | 48 off |
| 3-inch | 54 off |
| 3¼ and 3½-inch | 56 off |
| 4-inch | 59 off |
| 4½, 5 and 6-inch | 48 off |

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed.

**SEAMLESS STEEL MERCHANT BOILER TUBES**

Extras:

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

**SEAMLESS STEEL MECHANICAL TUBING**

**Base Discounts on New List July 1, 1925**

Carbon 0.10 to 0.30 per cent.....50 to 55 off

Carbon 0.30 to 0.40 per cent.....45 to 50 off

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

**SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES**

| Outside diameter | Gage | Net prices per foot f.o.b. Pittsburgh Price |
|---|---|---|
| 2-inch | 12-gage | 14¼c |
| 2-inch | 11-gage | 15c |
| 2-inch | 10-gage | 16c |
| 2¼-inch | **12-gage** | **16c** |
| 2¼-inch | 11-gage | 17c |
| 2¼-inch | 10-gage | 18c |
| 3-inch | 7-gage | 33c |
| 5⅝-inch | 9-gage | 50c |
| 5½-inch | 9-gage | 52c |

Plus usual extras for forming and for lengths over 24 feet.

## Plate Extras

**BASE**

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, date Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

**All Plates Rectangular or Otherwise**

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weight.

| | |
|---|---|
| Over 100 to and including 110 inches | .05c |
| Over 110 to and including 115 inches | .10c |
| Over 115 to and including 120 inches | .15c |
| Over 120 to and including 125 inches | .25c |
| Over 125 to and including 128 inches | .50c |

Plates less than ¼-inch or lighter than 11 pounds per square foot.

| | |
|---|---|
| Over 72 to and including 84 inches | .10c |
| Over 84 to and including 96 inches | .20c |
| Over 96 to and including 100 inches | .30c |

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.

**GAGE**

**Plates Not Exceeding 72 Inches Wide**

Plates less than ¼-inch gage, to and including $\frac{7}{16}$-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds square foot..... .20c

**Plates Over 72 Inches Wide**

Plates less than ¼-inch gage, to and including $\frac{7}{16}$-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds square foot.... .20c

Plates ordered 7.65 pounds square foot .30c

**QUALITIES**

| | |
|---|---|
| Pressing steel | .10c |
| Flange steel (boiler grade) | .15c |
| Ordinary firebox steel | .20c |
| Stillbottom steel | .30c |
| Locomotive firebox steel | .50c |
| Marine steel | 1.50c |
| Hull materials subject to U. S. Navy Dept. specifications for medium or soft steel | .10c |
| High tensile hull steel subject to U. S. navy department or equivalent specifications | 1.00c |
| Boiler steel subject to U. S. navy department specifications, classes A-B | 1.50c |
| Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel. | |

**Floor Plates**

Checkered plates ..... 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

**INSPECTION**

Mill inspection .....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

**CUTTING**

**LENGTH OR DIAMETER**

**All Plates, Rectangular or Otherwise**

| | |
|---|---|
| Five feet and over up to published limit of length, but not over 80 feet | No extra |
| Under 5 feet to 3 feet inclusive | .10c |
| Under 3 feet to 2 feet inclusive | .25c |
| Under 2 feet to 1 foot inclusive | .50c |
| Under 1 foot | 1.55c |
| Over 80 feet to 100 feet inclusive | .10c |

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

**Regular Sketches**

With not more than four straight cuts. (Including straight taper plates)

Additional extra ..... .10c

**Irregular Sketches**

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)

Additional extra ..... .20c

*Model 24-P ejection type press, having box 100" long, 20" wide, 42" deep. Finished bales measure 20" x 14" x 14" minimum. Can be equipped with power operated loading hopper.*

# LOGEMANN SCRAP METAL PRESSES

**Hydraulically compressed scrap commands at all times the *best price*, and can be conveniently stored and held for favorable markets; it is easily handled; it practically eliminates corrosion; it saves much time in remelting; cars can be easily loaded to capacity.**

***LOGEMANN Presses* are built in several types and sizes to suit all requirements.**

***You cannot go wrong on a LOGEMANN—it's a money maker from the day it is set in operation.***

## PIONEERS!

**LOGEMANN Scrap Metal Presses, pioneers in this industry, enjoy an enviable reputation for long life and economical operation. They are in daily use in practically every large sheet mill, stamping plant, scrap yard, and in metal-working establishments of all kinds.**

**Our many years of accumulated experience, and services of our Engineering Department are at the disposal of all plants accumulating metal scrap of any kind.**

**LOGEMANN BROTHERS COMPANY, 3126 Burleigh St., MILWAUKEE, WIS.**

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Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
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**ACETYLENE (Dissolved)**
Air Reduction Sales Co., 342 Madison Ave., New York City.
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Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

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Vanadium Corp. of America, 120 Broadway, New York City.

**ALUMINUM**
Summerill Tubing Co., Bridgeport, Pa.

**ALUMINUM (Vanadium)**
Vanadium Corp. of America, 120 Broadway, New York City.

**ALUMINUM BRONZE (Acid Resisting)**
Duriron Co., Inc., The, Dayton, Ohio.

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**ANNEALING BOXES**
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Petroleum Iron Works Co., The, Sharon, Pa.
Smith, George H., Steel Casting Co., Milwaukee, Wis.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bk. Bldg., Pittsburgh.

**ANVILS (Cast Steel)**
West Steel Casting Co., 805 E. 70th St., Cleveland, O.

**APPRAISALS**
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.

**ARCHES (Suspended)**
Detrick, M. H., Co., 140 S. Dearborn St., Chicago, Ill.

**ARCHITECTS (Industrial)**
Austin Co., The, 16112 Euclid Ave., Cleveland, O.

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**BANDS (Iron)**
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**BARGES (Steel)**
American Bridge Co., 71 Broadway, New York City.

**BARRELS (Steel)**
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.

**BARS (Alloy)**
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.

**BARS (Concrete Reinforcing)**
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
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Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Migret, Rene, 7 Boulevard DeFontaine, Charleroi, Belgium.
Nicetown Plate Washer Co., Inc., Juaniata & Clarissa Sts., Nicetown, Philadelphia, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago.

**BARS (Iron)—See IRON (Bar)**

**BARS (Steel)**
Bethlehem Steel Co., Bethlehem, Pa.
Bliss & Laughlin, Inc., Harvey, Ill.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Pacific Coast Steel Co., Hunter-Dulin Bldg., San Francisco, Calif.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago.
Tennessee Coal, Iron & Railroad Co., 1351 Brown-Marx Bldg., Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Youngstown Sheet & Tube Co., Youngstown, O.

**BEAMS, CHANNELS, ANGLES, ETC.**
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Migret, Rene, 7 Boulevard DeFontaine, Charleroi, Belgium.
Phoenix Iron Co., The, 20 So. 15th, Philadelphia, Pa.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago.

**BEARING METAL**
Williams Alloy Products Co., The, Elyria, Ohio.

**BEARINGS (Ball)**
New Departure Mfg. Co., The, Bristol, Conn.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

**BEARINGS (Journal)**
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Hyatt Roller Bearing Co., Newark, N. J.
Timken Roller Bearing Co., The, Canton, O.
Williams Alloy Products Co., The, Elyria, Ohio.

**BEARINGS (Motor)**
Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

**BEARINGS (Roller)**
Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

**BEARINGS (Tapered Roller)**
Timken Roller Bearing Co., The, Canton, O.

**BEARINGS (Thrust)**
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Timken Roller Bearing Co., The, Canton, O.

**BEARINGS AND BUSHINGS (Brass and Bronze)**
Erie Bronze Co., 402 W. 19th St., Erie, Pa.
Williams Alloy Products Co., The, Elyria, Ohio.

**BENDING AND STRAIGHTENING MACHINES**
Cleveland Punch & Shear Works Co., The, 3917 St. Clair Ave., Cleveland, O.
Hinman, D. A., & Co., Sandwich, Ill.
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Long & Allstatter Co., Hamilton, O.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.

**BENZOL AND TOLUOL RECOVERY PLANTS**
Koppers Construction Co., The, Union Trust Bldg., Pittsburgh, Pa.

**BILLETS (Alloy and Carbon Steel)**
Central Alloy Steel Corp., Massillon, O.
Hausman & Wimmer Co., The, Clark Bldg., Pittsburgh, Pa.
Washburn Wire Co., Phillipsdale, R. I.

**BILLETS (Die Stock Steel)**
Hausman & Wimmer Co., The, Clark Bldg., Pittsburgh, Pa.

**BILLETS (Forging)**
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.
Erie Forge Co., Erie, Pa.
Hausman & Wimmer Co., The, Clark Bldg., Pittsburgh, Pa.
Heppenstall Forge & Knife Co., 47th and Hatfield Sts., Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Wood, Alan, Steel Co., Conshohocken, Pa.

**BILLETS (Forging, Alloy Steel)**
Bethlehem Steel Co., Bethlehem, Pa.

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